SOCIO-ECONOMIC ASPECTS OF THE EXPORT WOODCHIP INDUSTRY IN TASMANIA

by

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ABSTRACT

A contribution is made toward assessing some socio-economic effects of the export woodchip industry in Tasmania. This is considered important since the industry was initially promoted as being desirable from the point of view of rural development and other social and economic benefits. This thesis examines woodchip industry effects at both the State and regional level and is introduced by reference to studies of the social and economic role of forest industries in Australia and New Zealand.

Observation of the nature of the Tasmanian economy and trends in major forest industries shows that the export woodchip industry epitomizes the peripheral economic position of Tasmania and represents a continuation of the major thrust of change in Tasmanian forestry, involving concentration of control over Crown forests, increasing capital intensity of industry, and declining employment with rising volumes of wood used.

Review of the operation of the two export woodchip companies in Tasmania shows that the industry has furthered control over Crown forests by one company, Associated Pulp and Paper Mills Ltd, and that the stated intentions of legislation covering concessions to Crown forests from which woodchips are produced are unlikely to be fulfilled.

Employment associated with the woodchip industry is discussed and it is shown that approximately 1300 people are employed in cutting, handling, and processing of pulpwood for export. Application of an employment multiplier suggests that the industry supports approximately 3750 jobs throughout Tasmania.

The state-wide appraisal of woodchipping also involves an assessment of public expenditure on transport infrastructure for the industry and on Forestry Commission management of concession areas. It is estimated that the industry receives a minimum public subsidy

of $10 million annually.

Regional effects of the industry are investigated in a comparative case study of two municipalities, Spring Bay and Esperance. Greater impact in terms of population growth and increasing employment is apparent in the smaller Spring Bay municipality where pre-existing industry was less developed and which lacked an appreciable background in forestry.

The results of a questionnaire survey of community attitudes in both municipalities are reported. Opinions and attitudes are examined by two approaches; general opinions are described while attitudes to particular aspects of municipal life and the woodchip or woodpulp industry are measured using Likert-type attitude scales.

Both communities regarded the respective industries favourably, but in Spring Bay, the woodchip industry was found to be more widely supported than was the woodpulp industry in Esperance. Significant problems associated with each industry mainly involved environmental and forest management concerns. Factors which most influenced attitudes in both municipalities are also identified and discussed in terms of differing historical development and industry effects.

While the regional significance of the export woodchip industry is acknowledged, on a state-wide level the benefits are not as conspicuous. This thesis highlights the need for continuing assessment of the industry on both levels.

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ABBREVIATIONS

The major forest-based companies operating in Tasmania are frequently referred to in this thesis and, in order to avoid the repetitious use of company names, the following widely recognized abbreviations are used:

APPM	Associated Pulp and Paper Mills Ltd
APM	Australian Paper Manufacturers Ltd
ANM	Australian Newsprint Mills Ltd
TPFH	Tasmanian Pulp and Forest Holdings Ltd

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CHAPTER 1

INTRODUCTION

Nearly 13 years have passed since the export woodchip industry began operating in Australia. The first woodchip mill was established in New South Wales in 1970, followed quickly by three in Tasmania and another in Western Australia. The industry was encouraged and welcomed by the respective State Forestry Commissions as well as industrial groups and politicians. Tasmania, more than any other State, enthusiastically embraced the industry; woodchipping was promoted as the ideal way to dispose of forest and mill waste and, by clearfelling native forest, to make "new" forests for the future. Furthermore, additional benefits from the first woodchip industry on the East Coast were predicted to include employment in depressed rural areas, foreign exchange earnings, the construction of an extensive forest road network, and Government revenue from a previously unsaleable product, as well as from income and other taxes (McCuaig 1981).

Enticements such as these created the climate whereby the woodchip industry in Australia developed very quickly; the level of investment in mill and plant was relatively low compared with pulp and paper manufacture, and so the activity was also attractive from an industry point of view. In a matter of several years from despatch of the first shipment of woodchips, Australian companies had gained approval to export up to 3 750 000 tonnes of woodchips annually (Cromer *et al.* 1975).

In 1973, partly in response to public concern at the environmental consequences of this industry, the Federal Minister for the Environment and Conservation, together with the Minister for Agriculture, initiated the formation of a working group to examine various aspects of the export woodchip industry in Australia. In 1975 this group recommended that:

> *The woodchip industry be subject to continuous assessment of its monetary and non-monetary impacts on society.*

It was further advised that:

> *Variations in export approvals and the approvals of new export woodchip projects should be subject to specific studies of their public investment and social impacts, in addition to environmental impact studies.*
>
> (Cromer *et al.* 1975)

Contrary to these recommendations, major export licence increases have since been approved for all export woodchip companies operating in Tasmania without public notification or the preparation of such studies. Other than publication of a financial analysis of the Forestry Commission's management of the concession areas of one woodchip company (Tasmania, Forestry Commission 1978), no "continuous assessment" of the export woodchip industry, as recommended by Cromer *et al.*, has occurred in Tasmania. This is despite the fact that Tasmania is Australia's major exporter of woodchips; over 75% of the total Australian approved volume of native forest pulpwood exported as woodchips (4 831 000 tonnes as of January 1981) comes from private and Crown forests in Tasmania.

Although the industry was originally described as being an interim measure until further processing plants were established (Tasmania, Forestry Commission 1968), recent company takeovers and the negative conclusions of a number of feasibility studies of projects for further processing, suggest that woodchipping will continue for some time. For a variety of reasons, further processing of pulpwood in Tasmania has not increased; in fact, the unexpected announcement by APM of closure of its Port Huon pulpmill for two years from December 1982 has raised the possibility of another "interim" woodchip scheme based on the wet eucalypt forests of this company's southern concession areas. Similarly, in Victoria, attempts are still being made to establish an export wood-

chip scheme based on the forests of East Gippsland and a "trial" woodchip scheme was carried out in the first half of 1982. It appears that there is no immediate end in sight to this industry in Australia and especially none to that in Tasmania.

In this situation, after nearly 12 years of export woodchipping in Tasmania, it seems appropriate to examine the Tasmanian experience, both in respect of local expectations originally held for the industry and of the possible implications for the establishment of further schemes, whether in this State or elsewhere. This thesis contributes to a "continuous assessment" of the Tasmanian experience through an examination of various economic and social factors connected with the export woodchip industry in Tasmania. While most discussion of woodchipping has focussed on its environmental impact, this study is primarily concerned with the industry's impact on the Tasmanian community.

The woodchip industry has some distinctive features such as centralized mill locations but, at the same time, supports activity throughout most of the accessible forests of the State. In recognition of this characteristic (as well as the small size of the State) the examination is carried out on two levels. The broader level looks first at other socio-economic studies and then to Tasmania itself, briefly describing the island's economy in order that forest industries may be seen in the total State perspective. From amongst the major forest industries, the woodchip industry is isolated and its features contrasted with those of more established industries. Statewide aspects of industry operation which are in turn assessed include legislative provisions, employment structure and some public costs which are incurred.

In consideration of localized effects of the industry, particularly in the vicinity of woodchip mills, the second level of analysis is much narrower and is directed toward assessment of the industry influence on the municipality of Spring Bay on the East Coast of Tasmania, where

TPFH (a subsidiary of APPM) operates a woodchip mill, set up in 1971, which is licensed to handle up to 900 000 tonnes of woodchips annually (until 1986). The industry's influence is examined in terms of its effects on employment trends and various sectors of the local economy, as well as on demographic and social characteristics. These effects in Spring Bay are compared and contrasted with Esperance, a municipality with a different historical background, where the pelletized pulpmill of APM, having been in operation for nine years longer than TPFH, was still operating at the time of the study. The comparison was done in order to assess the impact of a large centralized forest industry on regional communities with very different historical backgrounds and socio-economic characteristics. The operations of APM, in many respects, resemble a small woodchip scheme (approximately 200 000 tonnes of pulpwood were used annually in the early 1980s), although some processing to pulp is carried out and the produce shipped to mainland Australia for further processing, rather than to Japan or Korea (as with all woodchips exported from Tasmania). In order to gauge the less tangible social consequences of the woodchip industry both communities were also surveyed by interview questionnaire examining people's attitudes and perceptions of their community and the industry.

The export woodchip industry currently represents by far, the dominant form of wood production in Tasmania. Its position has been established within a short period of time and has taken place with very little detailed assessment of its social and economic impact. By drawing together a wide variety of information from many sources in an examination of some socio-economic effects of the woodchip industry, this thesis attempts to remedy this lack of analysis. The study, however, should only be viewed as part of a continuing assessment as originally suggested by Cromer *et al.* (1975).

CHAPTER TWO

FORESTRY AND DEVELOPMENT

Forestry has been described as both a "space using residual land use" (Kromm 1972) and as a tool of economic development (Sartorius and Henle 1968). As a residual land use, the potential of forestry to influence local development may be somewhat limited but it has been recommended for use in undeveloped areas (Westoby 1962) and in places with few natural resources (Gregerson 1973).

Especially in some of the frontier countries where forests have only been systematically exploited in recent centuries (notably Canada, Australia, and New Zealand), large forestry operations (like mining) have tended to produce single industry towns in relatively isolated non-industrialized areas. As discussed by Lea and Zehner (1982), Smith (1980), Park and Spearman (1980), and Roberge (1977) such industry towns may exhibit similar characteristics. In these countries sawmill towns were a common focus of early European settlement. Since the late 19th century in Canada and early 20th century in Australia and New Zealand, the siting of pulp, paper, and chip mills has maintained and expanded some existing timber towns and, in other instances, has created new development in areas with very little previous experience of forestry.

Establishment of rural forest industries based on indigenous forests or exotic plantations has often required a level of labour and variety of skills greater than that available locally. Such situations have attracted workers and their families from other areas to settle in the vicinity of new industry. Depending on the size and nature of the forest industry and distance from major population and industrial centres, these settlers have been accompanied, in time, by a varying number of additional people, services, facilities, and other industries. Together, these additions to otherwise static rural areas comprise what is commonly termed regional development. Increased discussion of this process has occurred in Australia and New Zealand

since the early 1970s, mostly in association with the effects of pulp, paper, or chip mill establishment (Scott 1975; Chapple 1976; Grant 1976, 1979), and the predicted effects of industrial processing of softwood plantations (Reilly 1974; Grant 1977; Greig 1979a).

On the other hand, some long-established forest-based communities face decline as quality timber supplies dwindle and pressures for changes in land use grow. Many pioneer sawmill towns have long ceased to support viable communities. The predicament of older communities has been described by quantifying community dependence on existing timber industry and estimating the social and economic effects of future wood supply reductions (Elton 1976; Higham *et al.* 1977; Kable 1981a,b). Analyses of this sort provide virtually the only assessment of more traditional forest-supported development.

The economy of Tasmania is more closely linked with forest-based industries than those of other Australian states. The island is still comparatively densely forested and has both long-established and relatively new forestry communities. Although no studies of forestry development have been carried out in Tasmania, the role of forestry in certain regions is considered to be very important and predictions of regional, social, and economic benefits have been used in support of new forestry projects.

Ways in which forestry and development have been linked and analysed (principally in mainland Australian states and New Zealand) are reviewed in the first section of this chapter. Distinct sources and methods of analysis are recognized, as are some common features of forest-based communities. Most published work on this topic can be seen to come from particular interest groups and to be used for clearly defined purposes. In the second section the focus is narrowed to Tasmania with an appraisal of social and economic characteristics of forestry. For this purpose the island itself is treated as a region,

and forestry development is discussed within the context of the state's economy. In addition, areas of more intensive forestry-related development in the state are identified.

This chapter, therefore, has two main intentions. The first intention is to introduce other studies and regions and to show the range of factors which have been considered in measurement of social and economic effects of forestry development. Methods and approaches from these studies will be assessed for the purpose of examining, in later chapters, particular Tasmanian forestry regions. The value of examining these studies is also to show typical features of forestry communities which can then be compared with the selected Tasmanian communities.

The second intention is to provide a perspective of the overall Tasmanian situation from which detailed analysis of specific forest-based regions can proceed. The statewide importance of the woodchip and woodpulp industries which support these regions can thereby be judged, and total industry effects can be contrasted with localized effects. Thus, this statewide view will help to take into account inevitable leakage of industry benefits from local areas and provide a necessary extra dimension to the study of exclusively localized effects. The place of the woodchip industry in the total forest industry mix can also then be identified.

2.1 APPROACHES TO ANALYSIS OF FORESTRY DEVELOPMENT

There is a relatively small, but expanding volume of overseas and Australian literature dealing with the relationship between forest industries, or particular forestry projects, and regional development. In Australia and New Zealand, two distinct sources of this work are forest industry and forest service. In both cases, research has been

stimulated by predicted changes in the availability or level of utilization of timber (either raised or lowered). Most of the industrial publications which are discussed here have been prepared in response to the likelihood of lowered timber availability and thus are mainly concerned with quantifying some of the existing and potential effects on local communities. The work of forest services (Government agencies), in turn, has been mainly directed towards predicting employment and income effects of state planning and management proposals which would mostly involve future increases in the supply or level of utilization of timber. However, some forest service studies have examined existing communities in terms of employment and financial aspects and these will be given greater emphasis here. Other studies of social and economic effects of forestry projects have been carried out by sociologists, geographers, and environmentally concerned bodies, and may loosely be grouped together as a third source of research. Although exhibiting a wide variety of approaches, the third group of reports has generally undertaken more critical assessment of forestry development, often pursuing its less tangible consequences. Except for environmental groups, these researchers have constituted the only disinterested source of analysis of forestry development. Published work representing these three sources of investigation is used to demonstrate the different interests of each, methods of assessment of social and economic effects, and features common to rural forest-based communities.

2.1.1 Forest Industry Studies

Socio-economic publications by forest industries have arisen in response to real or predicted changes in timber allocation. Areas subject to such changes which have generated particular industry concern in Australia include the Victorian Alps and Washpool Forests of

northern New South Wales. A management plan for the indigenous forests of Southland, New Zealand, has created similar concern. Common and distinctive features of published reports written on behalf of, or in co-operation with forest-based companies from these areas, and also from Eden (New South Wales) will be outlined.

One of the first reports on the economic and social consequences of Australian forestry operations was commissioned in the mid 1970s by the pioneer woodchip export company, Harris-Daishowa Pty Ltd (Scott 1975). This company began exporting chips from Eden in 1971. The reasons for preparation of the report were stated to be:

(a) to know the present impact of operations,

(b) to establish a data base on which to make future proposals,

(c) to inform the public about the issues at stake, and

(d) *to prepare the ground for future requests for increased production* and for Australian equity investment in Harris-Daishowa.

In 1976, in response to the possibility of reservation of Victorian mountain ash forests in an Alpine National Park, a report on timber towns likely to be affected was prepared by consultants for the Forest Industries Resource Management (FIRM) Group (Elton 1976). This group consisted of 218 Victorian wood-fibre processing companies. Two similar reports, focussing on Grafton (Kable 1981a) and the Casino district (Kable 1981b), prepared for the Associated Country Sawmillers of New South Wales, were prompted by sawmillers directly affected by closure of the Washpool State Forests by the Forestry Commission of New South Wales in 1979. A fifth report from an industry viewpoint, dealing with the future of native forest logging in western Southland (the southernmost provincial district of New Zealand), was also prepared

for a group of sawmillers; the impetus came from anxiety about future log availability as a result of New Zealand Forests Service planning proposals (Higham *et al.* 1977). Two timber towns in Southland, Tuatapere and Otautau, were used to illustrate the importance of the timber industry to the district.

The objectives of these reports were very similar in that each was intended to quantify the dependence of the particular rural town or district on continuation of logging or processing activities. Dependence was assessed in terms of factors such as:

(a) numbers employed in forests and mills;

(b) multiplier employment effects;

(c) total numbers of dependent men, women, and children;

(d) the financial contribution of the forestry sector to the local economy through wages, payment for services, rates and other expenditure;

(e) capital investment by forest-based companies;

(f) the importance of the forestry sector to basic social services;

(g) involvement of forestry workers and their families in community clubs and societies;

(h) local perceptions of the economic importance of forestry to the area.

In addition, the Eden study attempted some sociological measurement of community attitudes to the woodchip industry. All of the other studies also provided estimates of likely local effects of diminished timber availability. The New Zealand study was the most forward-looking and constructive in this respect; it included an examination of the end-use, demand, and pricing of indigenous timber as a basis for minimizing social loss due to the inevitable decline in supply.

Sources of information utilized by all the reports included published statistics, company files, local officials, and questionnaire surveys.

From Table 2.1, which shows selected results from these studies, it can be seen that employment in forestry and forest-based manufacturing comprised a significant proportion of that available in each area. The numbers of people dependent on the respective forestry sectors were also considerable, notably in the Alpine Study Area in Victoria and in Tautapere in New Zealand. The value of industry payments, other than wages, is not comparable between studies due to differences in data collection and presentation.

Questionnaire surveys carried out by all the studies varied from that which was solely concerned with the financial situation of timber industry workers (Kable 1981a,b) to that which sampled the attitudes and opinions of all townspeople (Scott 1975). Sociological aspects of the Eden study were based on a survey of 247 town residents and covered attitudes to the woodchip industry, perception of changes in the area, comments on the future, and issues of concern. Of the people surveyed, 91% favoured the woodchip industry with the main issues of concern being housing and employment opportunities. Advantages of living in Eden were said to be the scenic nature of the town, the climate and nearby beaches, while the main disadvantages concerned the high cost of living and lack of social facilities. A survey of 50 timber industry people in the Alpine town of Heybridge, Victoria, showed strong identification with both the industry and the area. Some noticeable problems included lack of social activities for teenagers and women and, also, few employment opportunities for women. A questionnaire survey included in both the Casino and Grafton reports highlighted the dependence of timber mill employees and those working in linked industries, since, in the main, theirs was the sole family income and this was required for loan repayments. Most people expressed the desire to remain in the area to seek other work if timber jobs

TABLE 2.1

Selected findings of industry studies of the dependence of communities on forest processing

	Eden[a] (New South Wales)	Alpine Study Area[b] (Victoria)	Grafton[c] (New South Wales)	Casino District[d] (New South Wales)	New Zealand[e] Tuatopere	New Zealand[e] Otautau
	1975	1976	1981	1981	1977	1977
Employment in forests & mills	530	1250	600	160	158	53
% of labour force	30%	51%	64% (manufacturing employment)	40% (manufacturing employment)	~ 51%	~ 16%
Total employment (including flow-on employment)	-	~2000 (within area or adjacent)	1270	350	-	-
Total people dependent on forestry	-	4000 - 5000	3800	1260 (not all in district)	460	121
% total population of town or district	-	86%	~ 19%	~ 11%	55%	13%
Forestry sector wages per annum	$1.11 M (only company employees)	>$5 M	$15.4 M (includes that of flow-on employment)	$4.5 M (includes that of flow-on employment)	$0.8 M (after tax)	$0.3 M (after tax)
Industry payments (including payments for wood, material & services, royalties)	$12.9 M (includes contractors payments - $6.4 M)	$15 M	-	-	$0.3 M (services) 31% local rates	$0.1 M (services) 7% local rates
Capital investment	$7.3 M (1975)	$45 M	at least $18 M	at least $8 M	-	-
Local purchases by forestry sector employees	-	-	-	-	$0.7 M	$0.26 M

[a] SCOTT, W.D. and CO. PTY LTD, 1975; *A Study of the Environmental Economic and Sociological Consequences of the Woodchip Operations in Eden New South Wales;* Report prepared for Harris Daishowa (Australia) Pty Ltd, Sydney.

[b] ELTON, H.D., 1976; *Socio-Economic Study of the Timber Industry in the Alpine Area,* Report to the Forest Industries Resource Management Group; P.A. Consultants Pty Ltd, Melbourne.

[c] KABLE, J.C. and GREEN, R.J., 1981; *The Social and Economic Impact of the Washpool Timber Resource;* Associated Country Sawmillers of New South Wales, Sydney.

[d] KABLE, J.C., 1981; *The Socio-economic Effects on Casino of the Closure of the Washpool State Forest to Logging;* Associated Country Sawmillers of New South Wales, Sydney.

[e] HIGHAM, J.R.S., MENZIES, P., and RUSH, B., 1977; *Indigenous Forestry in Western Southland;* Business Development Centre, University of Otago.

were lost, but over 50% believed that they did not have the aptitude for other kinds of work. The New Zealand study utilized three surveys, one each of town residents, local organizations and selected local officials. These showed that Tuatapere was completely dependent on forestry employment whereas Otautau was less so. Examples of the importance of forestry employees in both communities included the finding that 27 out of 40 local organizations had more than 20% of membership from forestry families, while about 28% of local college pupils were from these families.

Except in the Eden study, assessment of the level of community dependence on the forestry sector was accompanied by estimates of employment and other losses likely to be sustained, given certain limitations in timber supply. The main effects that were predicted are summarized in Table 2.2. In the Victorian Alpine study it was concluded that, if logging in the area was discontinued in favour of a National Park proposal, opportunities for the communities resulting from increased recreational activities would not compensate for loss of timber industry employment and income. Similar conclusions were reached by the other reports. In the case of the two communities relying on the Washpool forests in New South Wales it was felt that "local social considerations are such as to justify a further examination of the district's Crown timber resources" (Kable 1981a,b). This report also expressed the view that the Forestry Commission objective of sustained yield was in conflict with retention of full employment. The New Zealand study determined that total annual economic benefits created by the forestry sector in western Southland far outweighed those from a lower level of activity. Hence, in the regional and national interest, it was recommended that log supplies be maintained at existing levels, at least for the 1980s. This work, alone, addressed the reality of diminishing native sawlog availability by suggesting

TABLE 2.2

Major predicted effects on communities of lowered timber availability

	Alpine Study Area[a] (Victoria)	Grafton[b] (New South Wales)	Casino District[c] (New South Wales)	New Zealand[d] Tautapere	New Zealand[d] Otautau
	1976	1981	1981	1977	1977
Number of timber jobs lost	–	–	–	–	30
Total jobs lost	2000 "at stake"	330 - 400	~ 150	–	–
Population loss	–	–	–	~ 336	~ 75
Redeployment cost	–	–	–	$0.4 M	–
Revenue loss	–	$9 M per annum	$4 M per annum	–	–
Loss of housing	–	Lowering of property values	Lowering of property values	$0.8 M	1/10 houses for sale
Impact on social services	–	–	–	Especially primary school, college, library, bank, hotel, picture theatre	Restricted service at primary school
Impact on local business	Range of retailers would narrow	–	–	20% reduction in sales	Turnover decrease of $0.5 M
Impact on local organizations	–	600 - 700 memberships affected	150 memberships could be affected	–	–
Investment loss	Sawmillers would lose, but not quantified	At least $19 M	At least $8 M	–	–
Other	Victorian houses would cost about $350 more Social strains of prolonged unemployment Loss of 500 jobs in Melbourne processing Loss of fire protection and increased fire risk	Closure of veneer mill & sawmills 200 potential retrenchments not suited to other forms of work Adult male unemployment would increase by about 65% Increased cost of living Increased cost of housing	57% of potential retrenchments not suited to other forms of work Closure or disruption of mills	Health service downgraded loss of teach- Loss of teaching staff at schools $1.0 M taken out of local economy	

[a] ELTON, H.D., 1976; *Socio-economic Study of the Timber Industry in the Alpine Area*, Report to the Forest Industries Resource Management Group; P.A. Management Consultants Pty Ltd, Melbourne.

[b] KABLE, J.C. and GREEN, R.J., 1981; *The Social and Economic Impact of the Washpool Timber Resource;* Associated Country Sawmillers of New South Wales, Sydney.

[c] KABLE, J.C., 1981; *The Socio-economic Effects on Casino of the Closure of the Washpool State Forest to Logging;* Associated Country Sawmillers of New South Wales, Sydney.

[d] HIGHAM, J.R.S., MENZIES, P., and RUSH, B., 1977; *Indigenous Forestry in Western Southland;* Business Development Centre, University of Otago. Effects of a 50% reduction in forestry.

medium-term action involving increased end-market prices and the servicing of higher value markets with lower volume cuts. Failure to consider this problem in the Victorian Alpine study has been recognized by Florence (1977) as a major deficiency. At the time of the study a lowering of log production to maintain a sustainable yield was planned to proceed from 1981 but the effects of this were ignored in the report. Both Washpool studies in New South Wales also failed to consider the implications of overharvesting of native forests and the eventual exhaustion of the timber supply.

Except for the Eden study, these publications describe a final, unwanted phase in forestry development; this involves contraction of communities as timber supplies become unavailable. From the presentation of largely employment-related and financial data, a high level of dependence on the forestry sector was apparent (particularly in the Alpine area of Victoria and at Tuatapere in New Zealand). Little evidence was provided of growth in other sectors (other than those servicing forestry), nor of the interaction between forestry and productive sectors. The main concern of each report was to promote the industry view, and thus essentially only supportive data was presented; in all cases this was prepared by consultants who were hired by interested forest processors. The approaches, basic assumptions, and conclusions adopted by these five reports represent one prominent Australasian view of forestry and development - that social and economic arguments support the industry case for continued logging. However, by quantifying the extent of dependence of some towns on forest industry, they provide cautionary warning of problems faced by over-dependent communities, as well as factors to be taken into consideration in the formulation of any alternatives to exploitative forest use.

2.1.2 Government Forest Service Studies

In Australia, Government forest services have increasingly included social and economic factors in consideration of forest allocation and planning. This situation has arisen with recognition of limits to forest production and through the service's role of selling forest produce from public land. Thus, if responsible forest management calls for a decrease in harvest rate and increase in royalty payment, such decisions may be deferred or modified according to the employment or other losses predicted by any forest firms which may be affected. Obviously, the larger the firm, the greater consideration is given to its predictions. However, few Government or University foresters have examined the social or economic impact of existing forest allocation patterns. Instead, emphasis has been placed on estimating social and economic benefits to support forest planning proposals, notably softwood planting projects. These predictive studies will be briefly mentioned here as examples of professional foresters using social and economic data in much the same purposive manner as industry has done. However, forest service work which has centred on *actual* rather than hypothetical communities will be the main concern of this sub-section.

Authors of predictive work include Ferguson (1972), Reilly (1974), and Greig (1979a,b). Ferguson concluded that information on the regional effects of a theoretical woodchip industry in Western Australia (derived from employment and income multipliers for the whole state), could be used in support of prospective woodchip projects. Reilly estimated regional employment and income multipliers from a hypothetical pine plantation project in Queensland. From this data, it was estimated that, by 2000, Australia's softwood planting programme could be expected to provide 130 000 jobs and support a population of 325 000.

Using data from South Australian softwood forestry, Greig (1979a) identified likely effects of establishing softwood plantations in Victoria (rather than maintaining predominantly hardwood forestry) as including positive changes such as increases in employee incomes, female employment, grower profits, and Forestry Commission royalties. The negative changes identified included increases in sawn wood prices and in the level of redundancy amongst mill workers, given constraints in log supply or marketing. Greig (1979b) has also begun to examine the employment consequences of changing forest land use by calculating employment coefficients for logging and log sawmilling as well as both wood production and recreation within Victorian State Forests. He concluded that "a change of 10 000 m^3 per year in the net volume of sawlogs will result in a long run change of 4.1 jobs in logging, 11.2 jobs in sawmilling and 1.2 jobs in forest management ... a change of 100 000 recreational visitor days per year will result in a long run change of 4.4 jobs in recreation management, and a smaller change in jobs in the recreation service industry." In New Zealand, the likely regional impact of forest projects has also been considered and local employment multipliers have been used in regional forest planning (New Zealand Forest Service 1975) and in debate over the best processing options (Grant 1977; Collins *et al.* 1977).

Publications by Government foresters dealing with existing forest-based communities include those by Kennedy and Lodge (1976) and Grant (1976, 1979).

The report on Gembrook State Forest by Kennedy and Lodge (Forests Commission Victoria) used financial, economic, and social information in a similar manner to that of forest industry. The report was prepared in response to a particular Lands Conservation Council proposal which called for classification of an area of forest between Gembrook and Labertouche as State Park (to be managed for conservation and

recreation by the National Parks Service). It was intended to identify economic costs and benefits which could be expected from this recommendation. Kennedy and Lodge calculated that the value of Forests Commission income foregone by halting timber production represented an immediate opportunity cost to the community of about $1 038 000. Costs of management for exclusive recreation use and continued protection were expected to rise to $97 000 by 1996. The Shires of Pakenham and Buln Buln were identified as benefiting most from the Wood and Wood Products sector which obtained 26% of its inputs from other industries in the region. Because of higher backward linkages, larger multipliers, and a greater export/import ratio than tourism (as represented by the Wholesale/Retail sector) the Wood and Wood Products sector was claimed to be of greater economic significance to the community. The study reported that implementation of the National Park proposal would result in loss of 85 logging and sawmill jobs while decreased income and expenditure would cause a further loss of 26 jobs, but only about five new positions would be created in park administration. Re-employment of displaced forest and mill workers in the region was seen as being very difficult. These findings were compared with information on attitudes, attributes, and recreational patterns of forest visitors obtained by preliminary survey. It was concluded that social costs of closure of the forests to logging appeared to outweigh the benefits. Recreationists were said to spend little money in the area. Although 33% of the survey sample claimed to be offended by logging activities, this result was interpreted as "showing a remarkable degree of tolerance to traditional forest activities."

Grant (New Zealand Forest Service 1976, 1979) derived regional employment multipliers for the pulp and paper industry of Kawerau (a town almost completely dependent on this industry) of between 1.25 and 1.40. However, he stressed that multipliers calculated for

new plants are very sensitive to the pre-existing level of under-employment in the region; this is because many farmers and seasonal workers are likely to supplement their incomes by taking up forestry work. Establishment of a major forest scheme in a depressed rural area is therefore likely to result in multipliers as low as 1.1. In this situation, the effect on incomes will be more important and local income multipliers would be most telling. Because "at current stumpages little exotic forestry can be regarded as economically viable without social benefits", Grant stressed that regional employment and income effects must be maximized. Ways in which this was suggested as occurring are through Forest Service purchase of materials and equipment in the region, support of local servicing industries, and flexible employment arrangements to provide maximum seasonal opportunities for rural workers.

Employment and income multipliers which have been used by forest service studies are shown in Table 2.3. As discussed in sub-section 2.2.2, these must be used with caution. The range in values indicates that employment and income effects of a major forest-based industry may vary considerably depending on such factors as the level of processing undertaken and the size and industrial structure of the area in which they are measured.

From the foregoing, it can be seen that Government foresters have begun to use socio-economic data in a variety of ways in support of planning and allocation decisions. Largely, their efforts have neglected existing forestry developments except where land use changes which may affect timber production are proposed. Although Greig (1979b) and Grant (1977) have estimated the results of a limited range of forest utilization options in terms of employment and income, foresters have not yet approached forest planning from the point of view of the most socially desirable use(s) of a forested region.

TABLE 2.3

Income & employment multipliers reported for forest industries in Australia & overseas

Researcher	Area	Industry	Multiplier			
			Income		Employment	
Gamble 1968[a]	Pennsylvania	Pulp & Paper	1.88		-	
Kaiser & Dutrow 1971[b]	Southern U.S.A.	Sawmills	1.7		1.6	
		Pulpmills	3.6		3.7	
		Papermills	2.47		2.5	
Greig 1971[c]	Scotland	Pulpmill	-		1.45	
Ferguson 1972[d]	Western Australia	Woodchip Project	1.7		2	
		Forestry	1.68			
		Sawmilling	1.92			
Reilly 1974[e]	Southeast Queensland	Plantation Pine Project				
		1961	1.61		1.45	
		2000	1.58		1.55	
Grant 1976[f]	Kawerau (New Zealand)	Pulp & Paper mill	-		1.1 - 1.4	
			Type I*	Type II*	Type I*	Type II*
Kennedy & Lodge 1976[g]	Gembrook Area Victoria	Forestry & Logging	1.11	1.20	1.11	1.21
		Wood & Wood Products	1.33	1.45	1.33	1.46

[a] GAMBLE, H.B., 1968; The regional economic role of forest products industries, *Journal of Forestry* 66, 462-466. In: FERGUSON, I.S., 1972; Wood chips and regional development, *Australian Forestry* 36, 15-23.

[b] KAISER, H.F. and DUTROW, G.F., 1971; *Structure and Changes in the Southern Forest Economy 1958-1967;* USDA Forest Service Research Paper SO-71, Southern Forest Experimental Station, New Orleans.

[c] GREIG, M.A., 1971; The regional income and employment multiplier effects of a pulpmill and a papermill, *Scottish Journal of Political Economy* 18(1), 31-48.

[d] FERGUSON, I.S., 1972; Woodchips and regional development, *Australian Forestry* 36, 15-23.

[e] REILLY, J.J., 1974; Impact of softwood plantations on rural economic development in Australia, *Australian Forestry* 37, 142-152.

[f] GRANT, R.K., 1976; Local employment multipliers for the pulp and paper industry in New Zealand, *New Zealand Journal of Forestry* 6(1), 122-130.

[g] KENNEDY, I.R. and LODGE, J.J., 1976; *Gembrook State Forest - A Case Study in Multiple Use Management;* Forests Commission of Victoria, Melbourne.

* The Type I multipliers used include only direct and indirect effects. The Type II multipliers include induced effects, that is, household spending is taken into account.

2.1.3 Alternative Studies

Researchers outside forest industry/service circles have adopted different approaches to the relationship between forestry and people. In New Zealand, work has revolved around communities based on exotic pine plantations, but little independent study of this has occurred in Australia, possibly because of the youthfulness or location of plantations. In both countries, the circumstances of hardwood forestry have been treated in only minor detail.

The American geographer Kromm (1972), in an examination of the regional economy of North Michigan in the late 1960s, found the contribution of forestry (including logging, management, sawmilling, pulp and paper processing, and board manufacture) to the economy to be lower than anticipated. Findings reported include:

(a) creation of predominantly low income employment,

(b) establishment of virtually no other industries other than those using forest products,

(c) few recreational or social activities other than those out-of-doors,

(d) an apparently strong economy but only a relatively low level of development, and

(e) low population and limited commercial, social, and educational services and facilities.

Although admitting that forestry may often be the best land use strategy in some areas where more profitable development is limited by physical, economic and social conditions, Kromm argued that not only was its contribution to regional development limited but that a "one-crop forestry-dependent community" was less able to maintain economic stability.

The New Zealand sociologist, Chapple (1976), writing a descriptive account of the creation of a milling and pulp and paper based community at Tokoroa, observed many socially stressful situations. The town, situated according to industrial requirements, had failed to attract a significant level of secondary manufacturing industry, and hence employment opportunities for women and school leavers were limited both in number and variety. Housing layout and design had neglected human factors and resident security, conditional upon company employment, brought with it loss of certain freedoms. Most townspeople had been forced to quickly adjust to the new "rhythms and roles" of a rapidly expanded "synthetic community". Although stimulating for some, it was suggested that, for others, the cost in terms of loneliness, apathy, and frustration was high. Referring to the phenomenon of the mobile worker and family frequently forced to move to the next boom town, Chapple questioned the range and depth of social relations which could be established and highlighted the personal strain which achieving acceptance in new communities could cause.

Another New Zealand sociologist, Smith (1980), in reviewing work of rural sociologists, pointed to potential conflict between forestry-induced rural redevelopment and maintenance of viable rural communities. Fuguitt (1971) questioned the compatibility of growth with quality of rural life while Schwarzweller (1979) commented that arrival of many "new-comers" could be more disruptive to rural communities than slow depopulation. Bertrand (1978) recognized a number of unexpected problems which could arise from rural forestry projects. These included leakage of economic benefits from the rural community, short-run demands for services and facilities, and unbalanced (sex and/or age based) employment. Smith suggested that forestry may "promote anxiety" in rural communities due to a number of factors. These included:

(a) the scale of land use,

(b) the introduction of a new business and educated elite whose interests and views may conflict with those held by the existing elite,

(c) a new style of work with greater routine, less autonomy and flexibity, and

(d) the addition of another bureaucratic level which reduces local decision-making and increases the likelihood of external interests dominating over local interests.

With a view to providing background for appropriate planning of regional development, Smith and Wilson (1980) examined the preferences and concerns of residents from Mangonui County (northern New Zealand), in respect of five sector growth options, including state and private (company) forestry. Through a survey of 517 residents, details were obtained of community stability and satisfaction, perception of change and development, preferences and opposition to development, local information flows, and involvement in decision-making. A split in opinion as to the desirability of certain future industrial developments was not found to be obviously related to socio-economic characteristics, and thus was suggested as being situational rather than structural. Smith and Wilson cited physical, biological, economic, social, and cultural differences between regions as potential agents of conflict in particular localities. In the Mangonui study, traditional farming/forestry disagreement over land use was of less concern than the likelihood of clashes between tourism and private forestry over conflicting road use. Smith and Wilson concluded that "economic growth and increasing productivity may be a *result* rather than a *cause* of stability and contentment in rural regions"; in which case they stressed that social and economic planning should recognise local tensions caused by resource use.

A people-orientated alternative to the current direction of New Zealand forest management and industry has been promoted by Stephenson (Ecumenical Secretariat on Development 1981) who criticized the nature and amount of employment provided by increasingly large-scale, capital-intensive forestry projects. A more socially and economically desirable alternative was outlined, stressing quality of life and increased employment and job satisfaction through small-scale, locally-controlled forest industries.

In Australia, most efforts of people outside the forest industry/forest service axis have been environmentally motivated and directed toward warning of the ecological consequences of particular forest management techniques or attempting to prevent logging of certain forested areas. However, a small socio-economic study (Garton 1981) has been published by the Native Forests Action Council in Victoria. In anticipation of establishment of a woodchip industry in East Gippsland, visitors to a number of small towns in the area were questioned by survey about their knowledge of and attitudes toward the proposed industry. Over half respondents were ignorant of the proposed scheme while nearly 90% thought it would be "bad" for East Gippsland. At the same time, a business survey in the area showed that most businesses were in favour of establishment of a large woodchip industry in anticipation of increased population and business.

Although exhibiting some variety, publications from non-forest service or industry sources have tended to treat forestry-induced development in a more critical, less quantitative manner than the publications from industry and forest services. Authors have mainly confined assessment to existing forestry developments and have recognized a number of problems associated with them as follows:

(a) social activities, facilities, and employment opportunities (especially for women and young people), were limited;

(b) increasing stress caused by the introduction of more rigid urban-type patterns of work and organization caused a reduction in local autonomy and increased the possibility of diminished quality of life;

(c) the sudden influxes of new people with different values produced strains in personal relationships involving adjustments in the local social order.

It was also suggested that physical, economic, social, and cultural attributes of an area could influence the course of forestry development.

2.1.4 Summary

Examination of a range of literature dealing with various aspects of forestry development in Australia and New Zealand has shown three main sources of information - forest industry, forest service, and non-forestry researchers - each of which has had, to a certain extent, a vested interest in the outcome of the research. Industry has been concerned to collect and use large amounts of data (particularly financial data) in support of arguments in favour of maintaining or enhancing wood supplies, while forest service work has generally been intended to support forest planning as well as to maintain timber production from state forest. As a result, most of the reports or papers from these two groups were rather narrow in outlook and generally avoided tackling wider issues and consequences of development, such as medium to long-term prospects and alternative industry strategies or the problems of social strains which were addressed by non-forestry researchers and in particular by sociologists. On the other hand, social studies originating from this group tended to provide less financial data. The number and variety of studies reviewed here show that, although it

is a "residual land use" (Kromm 1972), forestry is increasingly being viewed in its development capacity. In this case, the existing sources of assessment of its role appear inadequate or insufficiently directed for the task.

From work of the three main groups studying the influence of forestry over social and economic development in Australia and New Zealand, a number of general conclusions can be drawn.

Several methods of assessing the effect of existing or planned forest industries have been used. Forest services and industry have used local employment multipliers calculated for particular regions to estimate direct and indirect employment. Surveys of forestry employees, businesses, and local organizations have been used to gauge the extent of dependence on forest industry through such indicators as jobs, forest industry purchases, forest workers' spending, level of social services supported by workers, involvement in social and sporting organizations, and home ownership. Again, these have been used by forest services and industry. Surveys of forestry employees, visitors, and businesses have given personal profiles of the first two groups and also some indication of attitudes and opinions held by all three. These surveys have been carried out by forest services, industry, and alternative researchers. However, time constraints have in all cases somewhat limited both collection and analysis of social data. Social studies of greater depth have used surveys and also passive participation in the community by the researcher. Fairly obviously, the most meaningful study of forestry and development combines different types of data from a variety of sources.

Some general conclusions arising from the results of socio-economic research may also be made. The most prominent feature of actual, rather than hypothetical, forest-based communities is the continuing dependence on forestry and failure to attract additional

industry in order to build a balanced economy. This seems understandable given the location and lack of alternative resources, except perhaps recreational destinations, of places such as Mansfield, Heybridge, Casino District, Tokoroa, Kawerau, Tuatapere, and Otautau. Also, current trends in most industries toward centralization in advantageous locations make these places even less appealing. In the absence of other major local industries, additional indirect employment generated locally by rural forest industries has assumed special importance.

Of the Australian States, Tasmania has the highest per capita production of forest products and hence a significant dependence on forestry and forest industries. The small size of Tasmania and the nature of the state's economy, and that of regions where forest industries operate, mean that effects of these industries are felt strongly in the vicinity of processing plants but also that the whole state experiences more general effects. For this reason, examination of local effects of particular industries (with emphasis on the export woodchip industry and using some methods in common with studies by industry, forest service and non-forestry researchers) will be approached within the context of these statewide effects.

2.2 CHARACTERISTIC FEATURES OF TASMANIAN FORESTRY

In turn, forestry has both hindered and enhanced the development of Tasmania. Changes have occurred in the form of forest utilization in response to the introduction of new technology and growth of new markets; this has resulted in a much greater scale of use by increasingly capital-intensive and centralized forest-based companies. These changes have individually and collectively affected the spatial and temporal pattern of settlement, the level and type of secondary industry in certain areas, and the occupations of living standards of many Tasmanians.

Tasmania itself may conveniently be considered as a region because it has an economy with distinct characteristics. These are largely a result of its island geography and are important in developing an understanding of the scale of the state's forest industry and hence the degree of influence which the major forest industries exert over the economy. The other feature of such a general perspective is the regionalization of particular effects of forestry in Tasmania. Details of these two aspects of Tasmania's forest industries are given in sub-section 2.2.1 below. Sub-section 2.2.2 discusses the major social benefits obtained from the Tasmanian forest industries. The study includes the effects of changing industry structure and wood use and an examination of the consequences of the commencement of export woodchipping. Particular attention is paid to industry employment, and economic multipliers are examined as a basis for estimating the magnitude of statewide employment effects.

2.2.1 Nature of the Tasmanian Economy and Forest Regions

The Tasmanian economy has come under increasing scrutiny since the early 1970s and several reports have detailed its characteristic features (State Strategy Plan 1975; Young 1976; Callaghan 1977; Wilde 1980; Davies *et al.* 1981; Taplin and Tighe 1982). The following general description of the Tasmanian economy is drawn principally from the work of these authors. Included is an outline of the state's major resources, the industrial structure, features of the largest manufacturing industries, overall trends in the economy, and some widely perceived state problems.

(a) The Economy

In broad terms, Tasmania has been recognized as a peripheral region destined through location and history to depend upon an industrial

structure which is narrow, specialized, and resource-based (Wilde 1980). Its principal resources are metallic minerals, forests, agricultural and grazing land, sea fisheries, and hydro-electric power. The major companies extracting minerals and wood (aided by the availability of cheap electricity) are large and foreign or Australian-owned with management situated in core regions outside Tasmania. Similarly, the products of these companies are mainly exported to these and other centres, in Australia and overseas, generally for further stages of processing. Such characteristics have caused Tasmania to be described as representative of an underdeveloped country within the Australian Federation of States (Stevenson 1976). The major forest-based companies (APPM, ANM, APM, and Forest Resources) typify this situation; all are owned and directed outside Tasmania and, together, export a large quantity of unprocessed woodchips overseas as well as pulp and rough sawn timber to other Australian states where the final products are manufactured.

Also typical of an "underdeveloped" country is the level of primary production: agriculture accounts for 37% of land use, forestry for 41%, and the proportion of the state's workforce employed by each of these activities is higher than the corresponding Australian average (Callaghan 1977).

In addition to its naturally occurring resources, Tasmania has developed an extensive hydro-electric system. Large amounts of power from this system were taken up, at very low cost, by the Electrolytic Zinc Co. in 1916 and by pulp and paper and newsprint industries (APPM and ANM) between 1938 and 1941. Similarly priced blocks of electricity helped to secure the establishment of two large energy-intensive industries, producing aluminium (Comalco Ltd) and ferro-manganese (Temco Ltd), in 1955 and 1962. By 1980, this ongoing process, combined with decreases in textile and clothing tariff protection, had

produced a manufacturing sector which consumed approximately 75% of the state's electricity and employed 15.2% of its total workforce (Australian Bureau of Statistics 1981a, 1981b; Hartley and Todd 1979). The imbalance in industrial structure is illustrated by the distribution of industrial electricity: 68% is taken by three firms providing 3% of total employment (Davis 1981). Major forest-based firms are contracted to use approximately 20% of industrial electricity and, in the mills alone, these employ 2% of the state workforce (Hydro-Electric Commission 1979; Australian Bureau of Statistics 1981a).

Tasmania, it has been observed, is more economically vulnerable to change than Australia is as a whole, due to its higher degree of dependence on export markets and consequent vulnerability to fluctuations in international commodity prices and demand (Callaghan 1977; Wilde 1980; Davis 1981). Although it has also been stressed that, due to the weakness of linkages with other sectors, the major industries do not have as significant an economic effect on the state as is possible (Callaghan 1977; Wilde 1980), it is clear that relatively large numbers of Tasmanian employees depend upon a few decision makers outside the state. A survey of the state's major power using industries showed that these employees were predominantly male and unskilled; only 5% of employees were women, as compared with 17% in the total mining and manufacturing sector, while 55% of workers were unskilled and only 10% classified as professional or technical (Hunter Valley Research Foundation 1980). By way of illustrating this resumé of the Tasmanian economy, Table 2.4 provides a numerical and statistical skeleton.

Overall trends in the Tasmanian economy since 1961 have been described by Wilde (1980). These include service sector growth (particularly since 1971), manufacturing decline (beginning noticeably in 1966), loss of rural employment in the late 1960s (since ameliorated),

TABLE 2.4

Some vital Tasmanian statistics

Population[a] ('000)	426.9
Density (No./km²)	6.25
Labour force[b] ('000)	187.6
Employed[b] ('000)	176.0
Unemployed[b] ('000)	11.6
Unemployed females[b] ('000)	5.9
Participation rate[b]	59.3%
Female participation rate[b]	41.7%
Male participation rate[b]	77.5%
Employed Persons by Industry 1981[c]	('000)
Agriculture and services to agriculture	11.2
Forestry, logging, fishing and hunting	3.4
Mining	4.8
Manufacturing	27.7
Electricity, gas and water	3.5
Construction	14.2
Wholesale and retail trade	32.2
Transport and storage	7.5
Communication	4.5
Finance, property and business services	10.6
Public administration and defence	8.2
Community services	33.8
Recreation etc.	11.4
Value of Exports 1977-78[d]	($'000)
Overseas	381 942
Interstate	645 102
Total	1 027 044
Balance of Trade (excess of exports)	277 084

[a] AUSTRALIAN BUREAU OF STATISTICS, 1982; *Population and Vital Statistics*, No. 3202.6; Australian Bureau of Statistics, Hobart.

[b] As at June 1981, from AUSTRALIAN BUREAU OF STATISTICS, 1981; *Labour, Wages and Prices Tasmania 1980-81*; No. 6101.6; Australian Bureau of Statistics, Hobart.

[c] As at August 1981, sources as in *b*.

[d] AUSTRALIAN BUREAU OF STATISTICS, 1981; *Trade and Shipping Tasmania 1977-78*, No. 5401.6; Australian Bureau of Statistics, Hobart.

Insufficient figures on the volume and value of major exports are published to provide a meaningful break-down of these total figures.

and a failed mining boom. Service sector growth has mainly provided jobs for women but, nonetheless, the 1978 female labourforce participation rate of 39.1% was 4.8% below the Australian average (Tasmania 1981; Australia 1981). Tasmania has been unable to match growth in the service and tertiary sectors to the decline in other sectors, with the result that employment growth has remained persistently below the Australian average.

Causes of the Tasmanian "problem" (Callaghan 1977) have been ascribed to the fact that Tasmania is an island and thereby suffers special disabilities and costs in transport which are exacerbated by the small population size and a high rate of outmigration in the 15-24 year old age group. This latter problem is said to be both a cause and an effect of the Tasmanian situation. It is typical of peripheral regions and results from an interplay of factors not solely employment related. In addition, from the point of view of economies of scale, the decentralized population, itself largely a product of the location of major natural resources, is a disadvantage in the provision of services and facilities. Regional communities which have grown to depend on extractive and energy-intensive industries, particularly mining, metal refining, and forestry, are in turn a boon and a liability to the State Government.

(b) Forest-based Regions

Some forestry regions of Tasmania (by virtue of location, natural resources, or general lack of other industry) resemble particular areas of New Zealand and mainland Australia as have been previously described. The Government of Tasmania (1979) has published some brief socio-economic observations on these regions but no studies of forestry-related development have been carried out in the state.

Activities associated with forest-based industries, are wide-

spread throughout the state. Basically, five fairly distinct forestry-supported population concentrations are recognizable (Figure 2.1) as follows:

(a) North West Coast region centred on Burnie but including many coastal and inland towns as well as Devonport; major forest products are pulp and paper, sawn timber, particle board, and veneers; APPM is the main forest employer;

(b) Northern region centred on the Long Reach woodchip mills and involving principally the municipalities of George-town and Beaconsfield (excluding sawing, dressing, and processing of wood in Launceston); main forest employers are APPM and Forest Resources;

(c) East Coast region centred on the Triabunna woodchip mill and including the municipalities of Spring Bay, Sorell, Glamorgan; main forest employer is TPFH (a subsidiary of APPM);

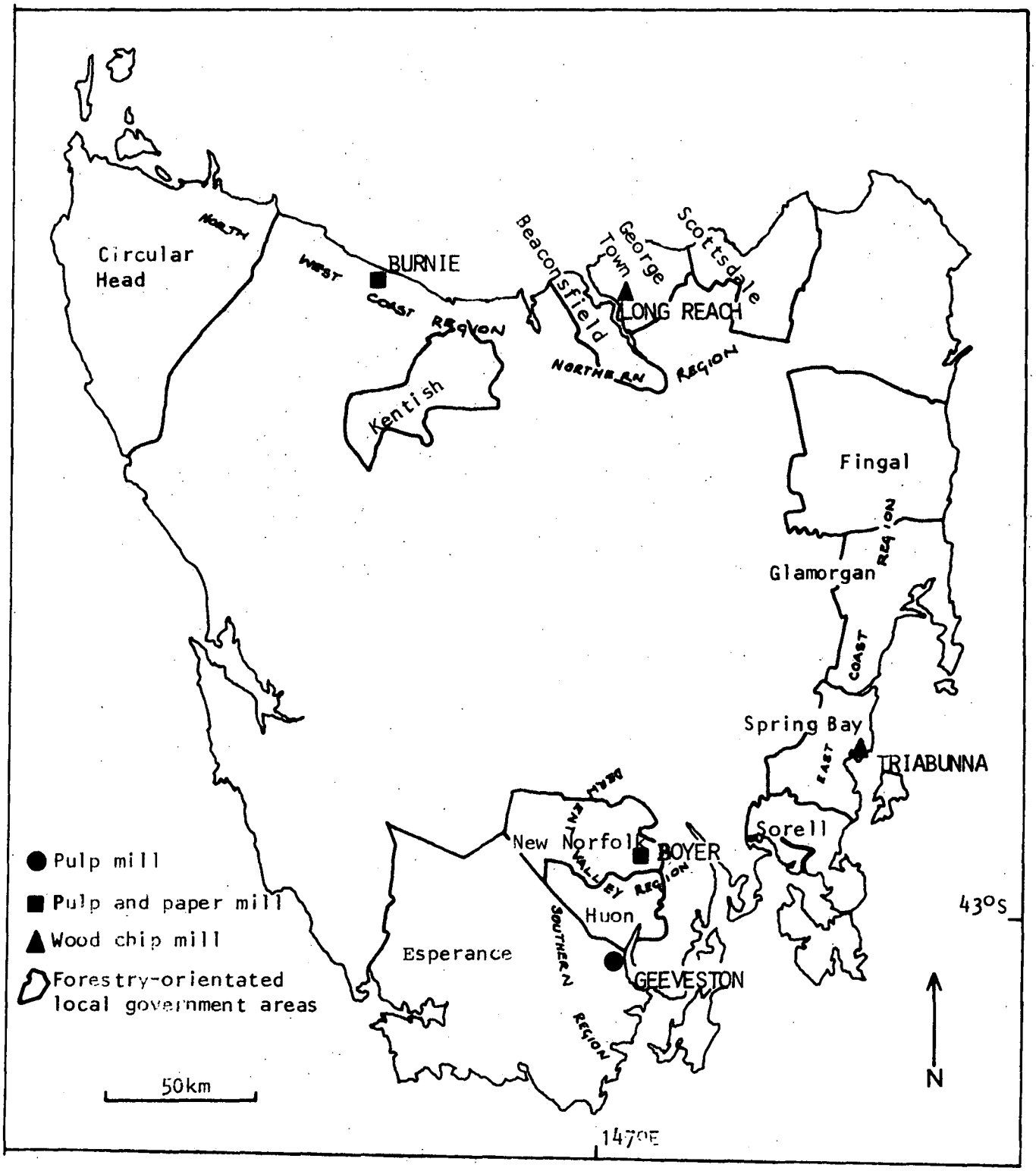
(d) Derwent Valley region centred on New Norfolk and principally involved in pulp and newsprint production with some sawmilling; main employer is Australian Newsprint Mills Ltd;

(e) South East region centred on Geeveston and including the municipalities of Esperance and Huon; the main forest product is pelletized pulp with some sawn timber; the largest forest employer is APM.

All of the regional forest-supported communities, to varying degrees, have been placed in a check situation by the end of 1982. Now, any reduction in wood supply to major industry, or of demand for particular end products, would result in loss or serious damage

FIGURE 2.1

Tasmania: Location of forestry regions



to the existing social and economic structure of each region. The sudden announcement in October 1982 that Australian Paper Manufacturers Ltd was to cease pulp production at Port Huon for two years, due to insufficient demand, has clearly revealed the vulnerable circumstances of these communities.

Description of the social and economic impact of forestry on these regions, to date, has relied largely on demonstration of population growth combined with information on increased house construction and some discussion of provision of other services and facilities in local government areas where forestry and forest industries are prominent (Tasmania 1979). Table 2.5 shows census population figures for local government areas identified by the Forestry Commission as being forestry-orientated. Some coastal municipalities, such as Burnie, have been omitted due to the influence of other manufacturing establishments. However, all coastal municipalities between Devonport and Circular Head have increased in population since 1976 (ranging from 0.22% to 1.22% average per annum). All of the population increases shown in Table 2.5, except perhaps for that of Kentish, are in some measure due to establishment and build-up of the export woodchip industry. Of the four forestry municipalities experiencing population loss over the past 15 years, market failure in the fruit industry was a contributing factor in Esperance and Huon, and problems in the mining industry played a large part in Fingal's decline.

Most regions where forestry is an important activity occupy the same relationship to the central regions of the state as does Tasmania to mainland Australia and other trade centres. These regions are the state's peripheries. They contribute to the strains placed on the state government in the provision of services and facilities to a decentralized population. Also, forestry regions, like the state as a whole, can be seen to be vulnerable to changes in market prices or

TABLE 2.5

Estimated population (1966, 1971[a]) and resident population (1976, 1981[b]) in forestry-orientated local government areas

	1966	1971	1976	1981	Average annual population change 1976-1981 (%)	Major forest-based company
Southern Division		-			-0.01	
Glamorgan	1 125	1 120	1 330	1 610	+3.90	TPFH
Spring Bay	1 205	1 410	1 840	1 990	+1.58	
Sorell	3 309	3 630	4 490	5 420	+3.84	
New Norfolk	10 315	10 610	10 200	9 760	-0.88	ANM
Esperance	3 740	3 510	3 240	3 190	-0.31	APM
Huon	5 264	4 750	4 960	4 880	-0.32	
Northern Division					+0.77	
Beaconsfield	9 983	10 970	12 950	14 150	+1.79	APPM and Forest Resources
George Town	5 101	6 030	6 760	7 300	+1.55	
Fingal	3 791	3 440	2 980	2 950	-0.20	APPM and TPFH
Scottsdale	3 628	3 610	4 040	4 320	+1.35	APPM and Forest Resources
North West Division					+0.75	
Circular Head	7 884	7 980	7 930	7 930	-	APPM and Forest Resources
Kentish	5 614	5 320	4 140	4 310	+0.81	APPM

[a] AUSTRALIAN BUREAU OF STATISTICS, 1981; Estimated Population of Local Government Areas in Tasmania 30 June 1966 to 1980, catalogue No. 3201.6; Australian Bureau of Statistics, Hobart. Based on location on the night of census.

[b] AUSTRALIAN BUREAU OF STATISTICS, 1982; Estimated Resident Population of Local Government Areas in Tasmania 30 June 1976 to 1981, catalogue No. 3201.6; Australian Bureau of Statistics, Hobart. Based on usual place of residence on the night of census.

demand or to decisions made in Melbourne and Sydney boardrooms.

2.2.2 Forest Industries

Tasmanian forest industries are recognized as significant providers of income and employment for rural and urban people, as purchasers of local goods and services, as taxpayers, and as real or potential sources of re-investment capital from profitable forest processing. Also, they supply a range of readily available forest products for local use. However, such contributions are diminishing at a rate which is only partially arrested by a greatly increased throughput of wood. Dargavel (1980) has noted such overall trends as a decrease in employment and increase in output and fixed capital expenditure. This sub-section examines the employment and output trends for each industry, as well as the increasing production of value-added, and industrial multiplier effects on a statewide basis. Comparison of industries will provide an initial broad view of the woodchip industry in the context of the whole state and other forest industries.

Felling, dragging, splitting, sawing, and burning trees were activities which engaged many 19th century European settlers in Tasmania; the need was for land for food production or for timber to house the new colony. In the second half of the century, palings and sawn timber were exported interstate and overseas. Until the 1930s, traditional Tasmanian forestry was based on high quality logs and consisted essentially of scattered small sawmills, although there were some very large mills such as the Hopetown Mill at Strathblane which employed over 200 people at its peak. Many small pioneer farmers supplemented their incomes by splitting palings. Larger commercial interests became involved in the forest industry in the 20th century, as reported by Row (1980), and as witnessed by the establishment of

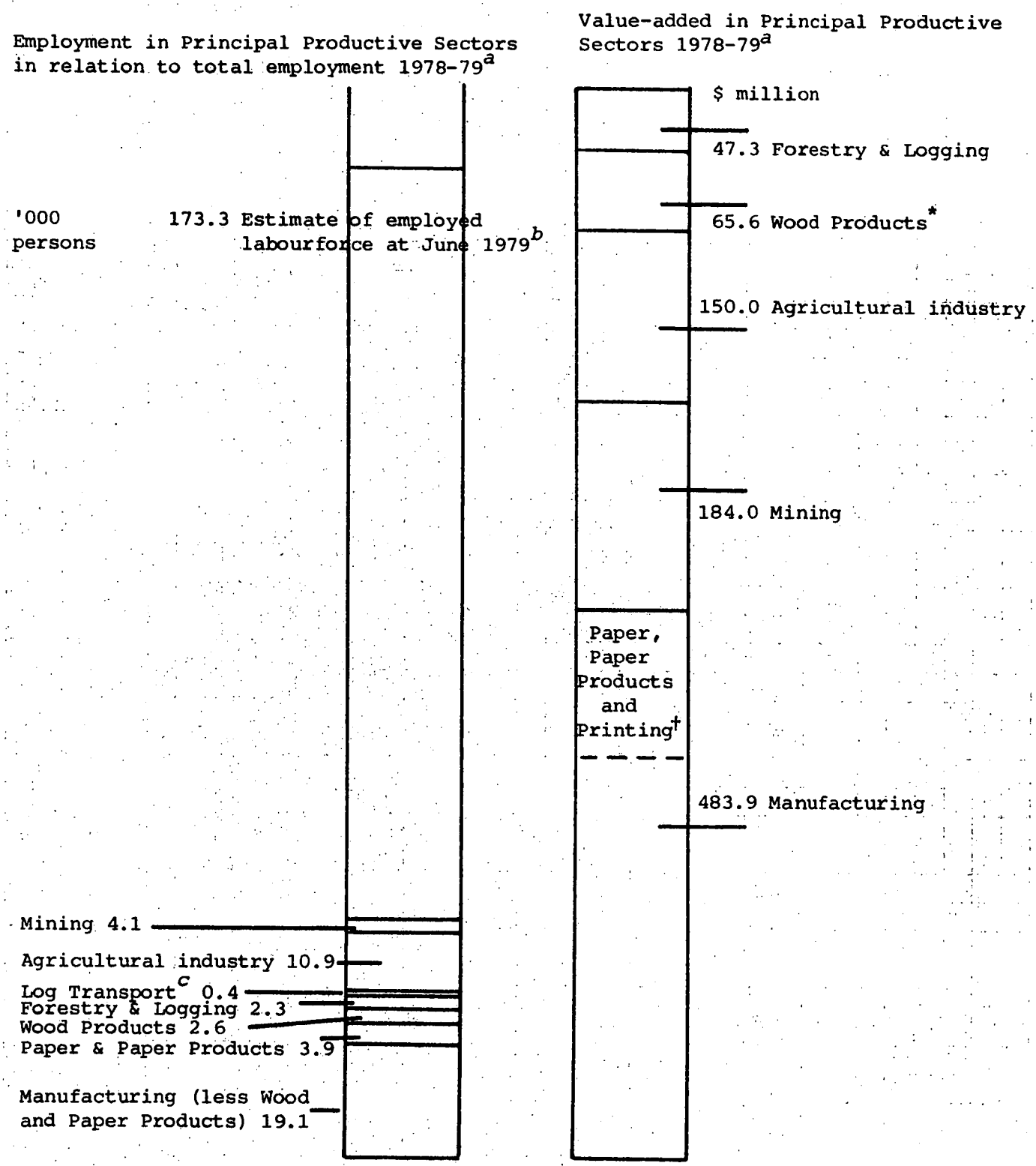
the first pulp and paper and newsprint industries in 1938 and 1941. Since that time, forest industries have produced an increasing diversity and volume of products. Industrial use of wood classed as pulpwood exceeded use of sawlogs in 1972, thus transforming Tasmanian forestry into predominantly a pulpwood-based industry.

Employment and value-added for principal productive sectors in Tasmania in 1978/79 are shown in Figure 2.2. Here, the forestry sector can be seen in the context of the rest of manufacturing as well as other important sectors. Publication of separate information on some forest-based industries (notably pulp and paper) ceased in 1978, and so reliable figures on total value-added are not available from that year onwards. The most recent figures for forest-based employment are derived from a number of sources. In 1980/81, Tasmanian forest-based manufacturing employment was 6879 (Department of Industrial Development personal communication), the number logging and hauling was estimated to be about 2000 (Tasmanian Timber Association 1982), and Forestry Commission employment was 735 (Forestry Commission personal communication). Thus, a total of approximately 9600 people were then involved in the logging, hauling, processing, tending, and managing of Tasmania's forests (5% of the state workforce).

Forest industry employment within the two Australian Standard Industrial Classification (ASIC) subdivisions Wood, Wood Products and Furniture (25) and Paper, Paper Products, Printing and Publishing (26) constituted about 25% of the state's manufacturing workforce (see Appendix A for details of the ASIC classification). Within these subdivisions, only industries belonging to ASIC group 253 (Wood and Wood Products) and class 2631 (Pulp, Paper and Paperboard) are included in this discussion. ASIC group 254 (Furniture and Mattresses) has been excluded because it comprises a significant degree of non-wood and non-Tasmanian wood-based manufacturing; ASIC classes 2632,

FIGURE 2.2

Employment and value-added for Principal Productive Sectors 1978-79



[a]Adapted from GOVERNMENT OF TASMANIA, 1980; *Submission to the Industries Assistance Commission Inquiry into Wood & Articles of Wood;* Government of Tasmania, Hobart.

[b]AUSTRALIAN BUREAU OF STATISTICS, 1980; *Labour, Wages & Prices Tasmania,* No. 6101.6; Australian Bureau of Statistics, Hobart.

[c]Estimate based on number at 30/6/78 in GOVERNMENT OF TASMANIA, 1979; *Submission to Senate Standing Committee on Trade & Commerce Inquiry Forestry & Forest Based Industries;* Government of Tasmania, Hobart.

*Excluding Furniture & Mattresses

†Value Added for Paper & Paper Products cannot be disaggregated from Publishing & Printing

3, 4, 5, (Paper Bags, Solid Fibreboard Containers, Corrugated Fibreboard Containers and Paper Products N.E.C.) are also excluded because companies in these classes utilize a high proportion of imported pulp. (The Department of Industrial Development also excludes these categories from any calculations relating to Tasmanian forest-based manufacturing.) With the addition of a small percentage of imports, employment in forestry and forest-based industries in 1981 was generated in the course of processing 992 200 m^3 of sawlogs and 3 678 600 m^3 of pulpwood (Australian Bureau of Statistics 1982). Considering recent downward trends in employment and the demand for forest products as discussed in the following pages leads to the conclusion that no more than 9000 people were engaged in forest-based employment in 1982. The most recently published figures for value-added indicate that $162.9 million ($1976/77) were produced by forest industries in 1976/77, 31% of total manufacturing value-added for that year (Australian Bureau of Statistics 1978).

Each forest industry class has distinctive features and these are outlined below in terms of (a) employment and number of establishments, (b) value-added, and (c) multiplier effects. The discussion will indicate the effects of industry restructuring, diminishing timber resources, and changing markets.

(a) Employment

Employment in all industry groups has fluctuated but, overall, the tendency has been towards reduced numbers of jobs (Table 2.6A). Employment in logging, carting, and administration (that is, the Forestry Commission) rose dramatically in the early 1970s when the woodchip industry first began, but has since fluctuated and declined, notably since 1973 (Table 2.6B). Overall, it appears that forest-based employment in the early 1980s was at least 2000 (or over 15%) less than in

TABLE 2.6

Trends in Tasmanian forest-based employment 1969-1980

Industry Class	ASIC CODE	1969	1970	1972	1973	1974	1975*	1976	1977	1978	1979	1980	Average 1969-1980	Difference between final year & average	Difference as % of average
		A. Manufacturing employment[a]													
Pulp, Paper & Paperboard	2631	3764	3920	4184	3940	4010	3862	3501	3805	3547[b]	n.p.	n.p.	3837	-290	- 7.5
Log Sawmilling	2531	1623	1575	1581	1501	1489	1146	1066	1537	1293	1342	1485	1422	-367	-14.7
Resawn & Dressed Timber	2532	1153	1233	1157	n.p.	1137	1359	1516	959	874	700	643	1073		
Hardwood Woodchips	2537	n.a.	n.a.	414[c]	n.p.	n.p.	n.p.	n.p.	n.p.	449	n.p.	n.p.	-	-	-
Wooden Structural Fittings & Joinery	2535	480	607	435	472	501	362	373	380	455	400	336	436	-100	-23.0
Veneers & Manufactured Boards of Wood	2533	n.p.	n.p.	n.p.	n.p.	401	371	380	n.p.	n.p.	n.p.	n.p.	-	-	-
Wood Containers	2536	136	130	121	225	241	n.p.	n.p.	192	n.p.	28	n.p.	153	-125	-81.9
TOTAL	253 2631	7679	7951	8130	8017	8279	7789	7444	7652	6965	n.p.	n.p.	7767	-802	-10.3
Total as % of Manufacturing Workforce -		24.7	25.0	26.2	26.1	26.3	27.0	26.8	27.6	25.8	24.9	-			
Total as % of State Workforce		-	-	5.2	5.0	5.0	4.7	4.5	4.5	4.1	-	-			

	1968	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
	B. Total forest-based employment										
Manufacturing[a]		8130	8017	8279	7789	7444	7652	6965	-	-	6879
Forestry, Logging and Carting[d]	1226	3813	4397	-	3171	3074	3345	3188	3166	-	~2740
Total Forest-based Employment	11943	11943	12414	-	10960	10518	10997	10153	10016	-	~9600

[a] HINTON, J., 1981 (unpublished); *Economic Indicators of Wood-Based Industries in Tasmania;* Centre for Environmental Studies, University of Tasmania, Hobart.

[b] EDWARDS, G.C. *et al.* 1981; *A 1977-78 Based Input-Output Model of the Tasmanian Economy;* Centre for Regional Economic Analysis, University of Tasmania, Hobart.

[c] AUSTRALIAN FORESTRY COUNCIL, 1974; Report of Panel 5, *Wood-Based Industries;* Forestry and Wood-Based Industries Development Conference, Australian Forestry Council, Canberra.

[d] AUSTRALIAN BUREAU OF STATISTICS, 1974-1981; *Australian Year Book;* Australian Government Publishing Service, Canberra.

* From 1975 on, figures refer only to establishments employing 4 or more people.

the early 1970s. However, as a proportion of all Tasmanian manufacturing, forest-based manufacturing employment has remained fairly steady, comprising 25% in 1969 and also in 1979.

Reclassification of establishments in Resawn and Dressed Timber and Log Sawmilling in 1976/77 has affected employment levels in these categories; in that year, approximately 500 jobs were transferred from the Resawn and Dressed Timber class and placed in the Log Sawmilling class. Also, from 1974/75 onwards, all establishments employing less than four persons were excluded from the manufacturing data. This has affected figures for Log Sawmilling and Wooden Structural Fittings and Joinery - see reductions in the number of these establishments in 1975 (Table 2.7). Employment in these industries is therefore slightly understated from 1975 onward. However, total industry employment would not have been more than 290 higher in 1975 and probably not more than 100 higher in 1980 (assuming that all falls in number of establishments in 1975 were due to the reclassification of 96 establishments and each employed three people; assuming also that closure of these establishments occurred to the same degree as larger ones in the two most affected groups - approximately 30% decrease between 1975 and 1980). Thus forest industry employment in 1979 was probably slightly less than 10% below the average for the decade 1969-1979. In every industry group, the most recently published (1978, 1979 or 1980) employment figure is significantly below average for this period. Employment levels were proportionately lower in smaller establishments than in larger ones.

Examination of employment trends for all Australia shows that Tasmanian employment in Log Sawmilling and Resawn and Dressed Timber fell from 11% of the Australian total (25 235) in 1969 to 10% in 1979 (total 21 706). Meanwhile Pulp, Paper and Paperboard employment, which was 33% of such employment for all Australia (11 430) in 1969, reached 35% in 1978 (total 10 025). In the same year, 67% of all Australian

TABLE 2.7

Trends in the number of establishments in Tasmanian forest-based manufacturing 1969-1980[a]

Industry Class	ASIC Code	Number of Establishments											Change 1969-1974	Change 1975-1980
		1969	1970	1972	1973	1974	1975[b]	1976	1977	1978	1979	1980		
Pulp, Paper & Paperboard	2631	4	4	5	5	5	5	4	4	4	4	4	+ 1	- 1
Log sawmilling	2531	196	183	172	159	148	93	100	92	77	74	71	-48	-22
Resawn & Dressed Timber	2532	34	31	28	26	22	24	29	23	23	20	17	-12	- 7
Hardwood Woodchips	2537	n.a.	n.a.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	6	5	5	-	- 1
Wooden Structural Fittings & Joinery	2535	79	81	77	75	77	40	39	38	33	30	25	- 2	-15
Veneers & Manufactured Boards of Wood	2533	3	3	3	3	3	3	3	3	3	2	2	-	- 1
Wood Containers	2536	22	23	12	13	12	8	7	7	3	3	3	-10	- 5

[a] HINTON, J., 1981 (unpublished); *Economic Indicators of Wood-based Industries in Tasmania;* Centre for Environmental Studies, University of Tasmania, Hobart.

[b] From 1975 on, only establishments employing 4 or more people are included.

Hardwood Woodchip industry employees (666) were in Tasmania. Employment levels have fallen throughout Australian forestry and forest industries; total employment in 1978/79 was 91 500 (Dargavel 1980b), or 15% less than that in 1967/68 which was a similar percentage loss to that sustained in Tasmania. Thus, in general terms, the Tasmanian situation is not unique. More rapid loss of jobs in Tasmanian Log Sawmilling and Resawn and Dressed Timber relative to all Australia (but relatively slower job loss in Pulp, Paper and Paperboard industries than in all Australia) reflects a different industrial panorama in Tasmania. This is composed of a large number of small, relatively unsophisticated sawmills becoming increasingly uneconomic, and a small number of large, old, pulp and paper plants. Forest-based manufacturing in mainland Australia consists of larger, more modern sawmills and pulp and paper mills.

The changing structure of Tasmanian forest-based manufacturing is clearly revealed in the declining number of establishments. Since 1975, decreases have occurred in each industry class and, in all, 52 establishments had ceased to operate by 1980. The dichotomy in scale of forest industries is shown by the large number of establishments (over 100) in Log Sawmilling, Resawn and Dressed Timber and Wooden Structural Fittings and Joinery (traditional industries) employing, in total, less than the four big pulp and paper mills. However, the dramatic rate at which the number of smaller traditional establishments is declining (an average rate of 18 per year between 1969 and 1974, and of 9 per year between 1975 and 1980 for those establishments employing four or more people) indicates a considerable shift in control of Tasmanian forest industries. Dargavel (1980a) has illustrated this concentration in terms of fixed capital investment; between 1969 and 1978, Tasmanian forest industries invested over $93 million in larger, more efficient production units to enhance productivity.

Table 2.8 shows the changing relationships between employment and the volume of sawlog, pulpwood and total wood cut between 1969 and 1980; these figures essentially represent the lack of downstream processing of an increasing forest cut. Industries have been grouped according to whether they are sawlog or pulpwood-using. These are general trends since the employment figures for sawlog and pulpwood production are approximate only, and the respective totals cannot be completely separated because the availability of hardwood sawlogs has become largely dependent on the level of pulpwood cutting in modern integrated pulpwood/sawlog operations. Nevertheless, it can be seen that, for each sawlog industry employee (Table 2.8A), an average of 330 m^3 of sawlog was cut annually between 1969 and 1980. Both sawlog employment and log volumes have declined but a trend apparent from 1978 indicates that employment is falling more rapidly than wood use. By comparison, prior to export woodchipping, the volume of pulpwood used per employee was 40-50% below that of sawlog (Table 2.8A,B).

Prior to 1972, pulpwood industries were more effective in employment generation per volume of raw material used. However in the following years pulpwood volumes rose dramatically. The 1969 pulpwood cut was exceeded nearly five times over in 1980 in order to supply export woodchip contracts. However, the absence of further processing of this wood past the chip stage has meant that the increasing volume provided little additional downstream employment and hence has contributed to a fourfold increase in the volume of pulpwood used per employee between 1969 and 1979. Overall, (Table 2.8C) the volume of all wood used per employee in forest industries has increased almost yearly since 1969 and, in 1979, was over twice as great. Employment in Forestry and Logging and log transport has expanded due to the new emphasis on volume of wood, (but the highest quality is still preferred). Although, as shown in Table 2.6B, employment in forestry, logging and carting rose

TABLE 2.8

Trends in wood production, employment, and wood produced per employee in Tasmanian forest-based manufacturing 1969-1980[a]

	1969	1970	1972	1973	1974	1975	1976	1977	1978	1979	1980
A. Volume of wood cut from Crown and private land ('000 m³)											
Sawlogs	1087	1062	1068	1085	1084	1062	978	981	895	850	928
Pulpwood[b]	766	870	1235	2057	3005	2988	2381	2843	2757	2886	3766
TOTAL	1853	1932	2303	3142	4089	4050	3359	3824	3652	3736	4694
B. Employment in forest-based manufacturing											
Sawlog-using industries[c]	3392	3545	3294	-	3368	~3067	~3155	3068	~2650	2470	2492
Pulpwood-using industries[d]	4287	4406	4836	-	4911	-	-	4584	-	4030	-
TOTAL	7679	7951	8130	8017	8279	7789	7444	7652	6965	-	-
C. Wood use (m³) per manufacturing employee											
Sawlog-using industries	320	300	324	-	322	346	310	320	338	344	372
Pulpwood-using industries	179	197	255	-	612	-	-	620	-	716	-
TOTAL	241	243	283	392	494	520	451	500	524	-	-

[a] Calculated from figures on Tasmanian forest production supplied by the Forestry Commission (1981) and employment as shown in Table 2.6.

[b] A conversion factor of 0.95 was used to convert original Forestry Commission figures from tonnes to m³.

[c] Comprising Log Sawmilling, Resawn and Dressed Timber, Wooden Structural Fittings and Joinery and Wood Containers.

[d] Comprising Pulp, Paper and Paperboard, Hardwood Woodchips and Veneers and Manufactured Boards of Wood (this latter class is predominantly a sawlog-using industry but employment figures cannot be disaggregated).

sharply in the early 1970s in response to establishment of the woodchip industry, employment growth has not been sustained and, in 1981, there were approximately 1600 fewer of these jobs than in 1974.

(b) Value-Added

Other important aspects of forest industries, shown in Table 2.9, are value-added and value-added per employee. Value-added, widely used as a basic measure of an industry's contribution to total production, remains nonetheless, an indicative rather than an absolute measure. Not all value-added remaining after payment of wages is available for profit since a variety of other payments must be deducted and, even then, some of the remainder may be transferred out of the state. Also, transfers between different branches of a vertically-integrated industry (such as APPM or APM) may not reflect the true cost of production and hence value-added may be under- or overstated. Expressed in 1978/79 $ values, value-added for total forest-based manufacturing has increased and, in 1977, was 34% greater than in 1969. Pulp, Paper and Paperboard industries produce the greatest proportion of value-added (some 42% of total forest-based manufacturing in 1977) followed by Log Sawmilling/Resawn and Dressed Timber. Although fluctuating within industry groups (complicated by reclassification as discussed previously) value-added has fallen in Log Sawmilling/Resawn and Dressed Timber and Wooden Structural Fittings and Joinery. Due to a change in the manner of calculation of value-added from 1979, the figures are not strictly continuous and, where published, trends up until 1978 are most reliable. Total value-added in forest-based manufacturing has remained a fairly steady proportion (28.8% - 32.2%) of all Tasmanian value-added.

Table 2.9B shows figures for value-added per employee. It can be seen that Hardwood Woodchips, due to its large volume of production, generates the greatest amount, at least twice that of Pulp, Paper and Paperboard. However, Log Sawmilling/Resawn and Dressed Timber are

TABLE 2.9

Trends in value-added and value-added per employee for Tasmanian forest-based manufacturing, 1969-80[a]

	ASIC Code	1969	1970	1972	1973	1974	1975	1976	1977	1978	1979	1980	Average 1969-1978	Difference between 1978 value & average	% Difference
A. Value-added $'000 78-79 values															
Pulp, Paper & Paperboard	2631	82 840	77 756	80 462	77 857	88 734	83 880	78 676	98 029	n.p. 25 606	n.p. 22 497	n.p. 31 803	83 529	+14 500	+17
Log sawmilling	2531	24 669	21 575	22 706	26 302	29 960	22 505	18 237	37 764	25 606	22 497	31 803	51 729	-10 925	-21
Resawn & Dressed Timber	2532	21 132	25 318	19 149	n.p.	26 022	43 595	40 880	19 503	15 198	12 897	10 485			
Hardwood Woodchips	2537	n.a.	n.a.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	24 719	26 429	n.p.	-	-	-
Wooden Structural Fittings & Joinery	2535	5 938	9 284	5 492	6 691	6 899	5 036	5 469	5 535	6 673	5 971	4 482	6 335	+ 338	+ 5
Veneers & Manufactured Boards of Wood	2533	n.p.	n.p.	n.p.	n.p.	12 037	9 732	8 921	n.p.	n.p.	n.p.	n.p.	-	-	-
Wood Containers[b]	2536	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	253 2631	168 498	168 924	170 766	194 013	215 595	214 692	198 620	224 786	-	-	-	194 487	+30 299	+16
Total as % of Manufacturing		31.0	28.2	28.9	30.0	31.0	30.7	28.2	30.2	-	-	-			
B. Value-added per employee $'000 78-79 values													Average 1969-1978	Difference between 1978 value & average	% Difference
Pulp, Paper & Paperboard	2631	22 009	19 836	19 231	19 761	22 128	21 719	22 472	25 763	-	-	-	21 615	+4 148	+19
Log Sawmilling	2531	15 200	13 698	14 362	15 523	20 121	19 638	17 108	24 570	19 804	16 764	21 416	39 947	-2 754	- 7
Resawn & Dressed Timber	2532	18 328	20 534	16 551	-	22 887	32 079	26 966	20 337	17 389	18 424	16 306			
Hardwood Woodchips	2537	n.a.	n.a.	-	-	-	-	-	-	55 053	-	-	-	-	-
Wooden Structural Fittings & Joinery	2535	12 371	15 295	12 625	14 176	13 770	13 912	14 662	14 556	14 666	14 928	13 339	12 630	+2 630	+15
Veneers & Manufactured Boards of Wood	2533	-	-	-	-	30 017	26 232	23 476	-	-	-	-	-	-	-
Wood Containers		-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	253 2631	21 942	21 246	21 004	24 200	26 041	27 563	26 682	29 376	-	-	-	24 756	+4 620	+19

[a] HINTON, J., 1981 (unpublished); *Economic Indicators of Wood-Based Industries in Tasmania;* Centre for Environmental Studies, University of Tasmania, Hobart.

[b] Value-added for Wooden Containers is relatively insignificant.

very significant, having experienced a peak in value-added in the mid 1970s. All other industry classes show most recent value-added figures above average for 1969-1978 and there has been a steady increase in total value-added per employee for total forest-based manufacturing. These changes represent the outcome of previously recognized trends such as declining numbers of establishments (and employment), increasing efficiency of those remaining, and increasing volumes of wood cut.

Table 2.10C shows figures for value-added per volume of wood cut from Tasmanian forests. Note the decline when Hardwood Woodchips commenced; in 1974, value-added per m^3 of wood was 57% of the 1969 level. This was because the product of woodchipping (which is the first, rudimentary stage in paper making) represents only one sixth of the value of the finished paper (Young 1976). A high proportion of timber is exported rough sawn - approximately 30% of the total state sawn timber production in 1981 (Tasmanian Timber Association 1981) - and thus the potential value-added (and employment) from the sawlog cut is also not fully realized. Although total annual sawlog production dropped by nearly 18% between 1969 and 1978, value-added/m^3 was 11% higher in 1978. Quite the reverse trend occurred in value-added/m^3 of pulpwood produced which, prior to the woodchip industry, was of the order of two-three times greater than that from sawlogs. As the volume of pulpwood cut for export woodchips increased during the 1970s, so value-added/m^3 fell and, within three years, had dropped below that produced by the sawlog cut. Between 1974 and 1979, annual value-added/m^3 pulpwood averaged one third of the 1969 level, while the pulpwood cut exceeded that in 1969 by a factor of three.

In summary, the main trends in employment, value-added, and wood production from 1969-1977/80 show that employment and number of establishments have declined in all branches of forest industry, but particularly in sawlog-based groups. Fewer people are being employed per

TABLE 2.10

Trends in wood production, value-added, and value-added per volume of wood produced, Tasmanian forest-based manufacturing 1969-1978[a]

	1969	1970	1972	1973	1974	1975	1976	1977	1978
A. Volume of wood cut from Crown and private forests ('000 m³)									
Sawlogs	1087	1062	1068	1085	1084	1062	978	981	895
Pulpwood[b]	766	870	1235	2057	3005	2988	2381	2843	2757
Total wood	1853	1932	2303	3142	4089	4050	3359	3824	3652
B. Value-added from wood processing (1978-79 $'000)									
Sawlog-using industries[c]	51 739	56 177	47 347	-	62 881	71 136	64 586	62 802	47 477
Pulpwood-using industries[d]	116 759	112 747	123 419	-	152 714	143 556	134 034	161 984	n.p.
TOTAL	168 498	168 924	170 766	194 013	215 595	214 692	198 620	224 786	n.p.
C. Value-added (1978-79 $) per m³ of wood used									
Sawlog-using industries	48	53	44	-	58	70	66	64	53
Pulpwood-using industries	152	130	100	-	51	48	56	57	n.p.
TOTAL	91	87	74	62	53	53	59	59	n.p.

[a] Calculated from figures on Tasmanian forest production supplied by the Forestry Commission (1981) and value-added as shown in Table 2.9.

[b] A conversion factor of 0.95 was used to convert original Forestry Commission figures from tonnes to m³.

[c] Comprising Log Sawmilling, Resawn and Dressed Timber, and Wooden Structural Fittings and Joinery. Wood Containers have been excluded but the amount of value-added involved is negligible. Sawlog value-added is under-estimated since veneers (manufactured from sawlogs) are included in the pulpwood category.

[d] Comprising Pulp, Paper and Paperboard, Hardwood Woodchips and Manufactured Boards of Wood (this latter class is predominantly a sawlog-using industry but employment figures cannot be disaggregated).

volume of sawlogs and pulpwood cut. In real terms, total value-added and value-added per employee in forest industries have increased, although not for all sawlog-using industries. However, less value-added is being produced per volume of wood, particularly pulpwood. Thus total value-added has only increased through dramatically rising pulpwood use. The Pulp, Paper and Paperboard industries (including APPM and ANM but not APM since the production of pulp involves only a low level of processing) provide the greatest amount of direct employment and value-added, require the least volume of wood per employee (Table 2.6A, Table 2.9A, and see figures for 1969 and 1970 Table 2.8C), and also provide the greatest amount of value-added per volume of wood used (see figures for 1969 and 1970, Table 2.10C).

(c) Multiplier Effects

Although employment and value-added in forest-based industries are important, the degree of interaction with other local industries is also significant; this depends on such factors as the quantity, type, and source of inputs necessary, and the nature and destination of outputs. Income and employment multipliers calculated for these industries as part of the 1977-78 based input-output model of the Tasmanian economy (Edwards *et al.* 1981) are shown in Table 2.11. As discussed in Section 2.1, these form the most prevalent means of estimating the flow-on effects of forest industries on other industry sectors. Multipliers basically indicate the increase in income or employment in other industries (based on transactions between industries) which could be expected from an increase in industry output to final demand.

However, multipliers must be used with some caution due to certain inherent restrictive assumptions. Foremost of these is the assumption of a direct and even relationship between employment/production and income/production. Edwards points out that this assumption may be invalidated if there exist "efficiencies of scale in the deployment of

TABLE 2.11

Employment and income multipliers for Tasmanian forest-based manufacturing, Forestry and Logging, and Log Transport, 1977-78[a]

Industry Class	ASIC Code	Representative Establishments	Direct Employment 1977-78		Employment Multipliers 1977-78			Employment effects per $'000 change in output	Income Multipliers 1977-78		
			Number	% of State Employment	Type IA	Type 1B	Type II		Type 1A	Type 1B	Type II
Log Sawmilling	2531	Britton Bros. Pty Ltd Consolidated Forest Owners Pty Ltd Webster Hall Timber Pty Ltd	1293	0.79	1.5	1.8	2.8	0.099	1.58	1.84	2.71
Resawn & Dressed Timber	2532	Clennett, B.G. Pty Ltd Gunn, J. & T. Pty Ltd Kemp & Denning Ltd Kilndried Hardwood Pty Ltd	874	0.53	1.6	1.9	3.1	0.109	1.63	1.95	2.87
Joinery & Fabricated Board	2533 2535-36	Burnie Timber Pty Ltd Kilpatricks Joinery Tasmanian Board Mills Ltd Tasmanian Plywood Mill Pty Ltd	802	0.49	1.4	1.7	2.7	0.095	1.41	1.69	2.49
Pulp, Paper & Paperboard	2631	APPM ANM APM	3547	2.16	1.5	1.7	2.9	0.061	1.40	1.55	2.28
Hardwood Woodchips	2537	APPM TPFH Forest Resources	449	0.27	3.8	5.5	9.25	0.078	3.42	4.47	6.58
Forestry and Logging	030	Encompasses the activities of the Forestry Commission - tending and regenerating - as well as contractors and bush workers - falling, dragging and loading	2537	1.55	1.6	1.8	2.9	0.090	1.37	1.47	2.16
Log Transport	part of 51-55	Largely run as small businesses by owner drivers or logging contractors	414[b] (440, 1981)[c]	0.25	1.30	1.38	2.19	0.110	1.24	1.30	1.92

[a] EDWARDS, G.C. (*et al.*), 1981; A 1977-78 Based Input-Output Model of the Tasmanian Economy; Centre for Regional Economic Analysis, University of Tasmania, Hobart.

[b] TASMANIA, STATE GOVERNMENT, 1979; *Submission to the Senate Standing Committee on Trade and Commerce Inquiry: Forestry and Forest-Based Industries;* Government of Tasmania, Hobart.

[c] TASMANIA, TRANSPORT COMMISSION, 1981; Personal communication. This figure would include casual and part-time drivers.

workers or under-employment of existing labour resources within an industry." Also, multipliers only refer to the effects of an increase in production at *one particular time* (in this case the year 1977/78); that is, they describe a static structural situation. Given the considerable structural adjustment occurring in the industry, this time discrepancy may significantly alter the multipliers for certain sectors, especially those undergoing most rapid change such as sawlog using industries. With lowered direct employment, multipliers would generally be expected to increase, but this may be complicated by changes in other industries. In addition, type II multipliers may be misleading in certain respects. Edwards advises that, because they refer to a change per unit of employment rather than per unit of output, they "should not be used as the sole criterion to rank industries in terms of their economic desirability". As an illustration, Table 2.12 shows that, although Hardwood Woodchips has the highest employment multiplier (9.25), employment effects of increased output would be greater in three other industry groups than in woodchipping. For instance, a $1 million increase in output to final demand in either Resawn and Dressed Timber or Hardwood Woodchips would result in an employment increase of 109 or 78 respectively.

Edwards followed the classification of multiplier effects as proposed by West and Jensen (1980). Three types of multiplier were derived:

(a) type IA was intended to measure the effect of increased purchases by the industry providing an additional dollar of output;

(b) type IB measured the effect of these initial purchases plus subsequent purchases by other industries;

(c) Type II indicated the total effect of industry purchases as well as that of increased wages and salaries from employees associated with increased output.

An illustration of the meaning of each type of multiplier will be given. Assume, for example that falling interest rates cause a small housing boom and the amount of additional sawn timber required for construction purposes results in 10 extra people being employed in Log Sawmilling. It would be expected that five additional people would be employed in industries from which Log Sawmilling makes purchases, principally logging and transport sectors (type IA multiplier = 1.5). These industries would, in turn, increase output, causing a further three people to be employed in other industries (for instance in fuel sales, machine repair and finance). Thus, in all, eight extra jobs would result from this chain of purchases stemming from Log Sawmilling (type IB multiplier - 1.8). If the spending of these 18 employees (ten direct, eight indirect) is also considered, then it is estimated that employment of an extra ten people would result throughout the Tasmanian economy. Therefore, the indirect and consumption-induced effects would total 18 (type II multiplier = 2.8) implying that, for every ten jobs created in Log Sawmilling, a further 18 would result elsewhere in Tasmania.

The location of indirect and induced employment would largely depend on the nature of each industry group and its input requirements. Since some of the largest forest-based manufacturing inputs come from forestry, logging and transport, and employees in these sectors often live close to the processing plant, at least a certain proportion of indirect and induced employment from an industry increase in output would be produced in the vicinity of the establishment.

Type IA, IB and II income multipliers operate in the same way as employment multipliers and indicate increased indirect and induced

income per dollar of increase in industrial output. Appendix B includes definitions of the major categories of multiplier effects, formulae used, and sources of information on which calculations of forest industry multipliers were based.

A brief consideration of the assumptions underlying income and employment multipliers as these affect forest industries shows that small sawmillers and timber dressing yards would generally be unable to practise efficiencies of scale due to lack of equipment (not to mention lack of timber), but this situation is rapidly changing through the effects of amalgamation and increased capitalization. Also, these operations, as well as the larger establishments, suffer periodic fluctuations in demand and, throughout the forest industries, underemployment is a recurring, if not constant, phenomenon. In such situations Grant (1976) has stressed the importance of income multipliers. Apart from Hardwood Woodchips, Resawn and Dressed Timber has the greatest employment and income effects, while Log Sawmilling has a higher income effect than Pulp, Paper and Paperboard despite the slightly greater employment effects of the latter.

High multipliers for Hardwood Woodchips are somewhat artificial due to a narrow definition of industry employment imposed by the Australian Standard Industrial Classification system (see Appendix A). The only employment taken to be directly produced by the industry is that at the chip mills. However, as discussed previously, this industry processes a large volume of wood to only a small degree and hence, compared to other forest-based manufacturing, a proportionally far greater number of people are employed in the associated industries of Forestry and Logging (bush workers and prime contractors) and Transport and Storage (log truck drivers).

Although multipliers refer to the effects of an increase in output to final demand at one point in time, they are commonly used to describe the influence of a static situation at another point in time. This use

is accepted practice but, as has been indicated, it does involve problems in adequately reflecting industry effects in a dynamic situation. In a recent derivation (Tasmania 1980) of a multiplier for the timber group of industries (Forestry and Logging, Log Sawmilling, Resawn and Dressed Timber, Woodchips and Joinery and Fabricated Board), the Department of Industrial Development attempted to avoid problems of double counting, which were encountered in an earlier derivation (Tasmania 1979) by aggregating base data from Edwards' 1977/78 model and performing a similar calculation to that used for individual industry multipliers. Using the resulting type II multiplier, 2.473, the Department estimated that the timber group was responsible for employing 14 700 people in Tasmania in 1978 (9% of average state employment in that year).

Using the same method of aggregation of 1977/78 data for pulp and timber industries gives a total industry type II multiplier of 3.539. Applying this to the most recent (1978) published employment figure of 6965 indicates a total employment effect (direct, indirect, and induced) of 24 650. Since 1978, direct forest-based manufacturing employment has fallen significantly (by mid 1982 it was probably closer to 6500), while employment multipliers are likely to have increased. The combination of these changes means that the total employment effect of pulp and timber industries throughout the state in mid 1982 would probably have been at least 23 000. However, the rapidly changing employment situation in the forest industries makes precise estimations impossible.

Certainly, forestry and forest industries generate significant employment, income, and value-added in Tasmania, but what is more problematic is the continuing effect on state and regional employment and income of the trends in forest utilization and industrial structural change which have been touched on here.

2.3 CONCLUSION

This chapter has discussed forestry and development on a number of levels. It has provided a review of predominantly Australian and New Zealand methods of analysing socio-economic effects of forest industries, primarily at the regional or local level. This has given some information on other forest regions which are similar to those in Tasmania (for instance, the Eden and Triabunna woodchip communities) and has shown a wide range of variables which may be measured in analysis of forestry development. These include direct and associated employment, size of dependent population, level of services and facilities sustained, involvement of industry people in local community organizations, effects on the existing community of a sudden influx of forestry workers, community attitudes to the development and its effects, influence of new patterns of work, industry contribution to existing rural underemployment, employment opportunities for women and youth, possibilities for industrial diversification, consequences of overdependence on forest industry, and medium-long-term prospects for the community.

Many studies of forest-based development appeared to strongly reflect the interests and concerns of the particular groups for which they were commissioned or to which the authors belonged (forestry industry, forest service and non-forestry researchers). These were reflected in the subjects of study, the data collected and the subsequent analysis of data. While few of the findings of these reports could be disputed as they stood, much of this work lacked objective examination of forestry development within a wider social and political context. Such a context would consider factors such as social need, public subsidization, assessment of costs and future trends. There appears to be an absence of appropriate institutional or other avenues for this type of analysis which is very important since poorly defined social benefits, such as

creation of large numbers of rural jobs through pine plantation establishment and processing (Reilly 1974) are being used as supportive arguments for particular projects.

From the various studies, some common points emerged. Generally, forestry development has amounted to establishment or maintenance of forest industries, and some forest industry services, in the most appropriate industrial locations. These support populations whose livelihoods are dependent on maintenance of sustainable levels of wood harvesting and an adequate and reliable demand for the processed output. Location of industries has apparently acted as a limiting factor to further development. Nonetheless, forest services have continued to promote large-scale forest projects in the name of rural development, but with little concern for what this actually entails or for the long or short-term social implications. This is particularly significant when a shift of emphasis to export of raw materials places local activity in the hands of uncertain overseas markets. On the other hand, mismanagement and overcutting of forests has created the situation of smaller-scale traditional industries using socio-economic data to oppose mangement decisions to reserve forests from cutting, or to lower the rate of cutting. Geographers and sociologists, analysing forestry developments from a more disinterested perspective, have recognized certain limits to the contribution of forest industries to rural areas, as well as real and potential social strains within newly created communities.

In Tasmania, the peripheral nature of the economy exacerbates the dependence on external factors so characteristic of forest-based regions. The state as a whole, and five areas in particular, were seen to be especially dependent on forest industries. The total employment effect of forest industries in 1982 was estimated to be approximately 23 000 (13% of the total workforce), of which no more than about 9000 people were directly employed in forest-based manufacturing, forestry, logging

and hauling. This number represented a fall of at least 15% since 1969. Losses have been greatest in small sawlog-using firms. While the volume of sawlog cut declined slightly between 1969 and 1982, that of pulpwood increased by nearly five times due to the export of woodchips. The Hardwood Woodchip industry has markedly different characteristics to pre-existing forest-based manufacturing. Compared to volume of wood used (approximately 50% of total in 1981), it employs only about 6% of forest-based manufacturing employment but, due to the large numbers required to cut and transport wood, it has the highest employment and income multiplier effects (9.25 and 6.58). During the first eight years of operation of the export woodchip industry (from 1971) it contributed to a great change in the overall characteristics of Tasmanian forestry; during that period the volume of wood cut per manufacturing employee increased by over 50% while the amount of value-added produced per m^3 of wood cut fell by approximately 35%.

Thus, the whole basis on which Tasmanian forestry has traditionally been founded is now virtually superseded. Industry, having modified the forests, is now itself becoming transformed as a consequence of these changes as well as the necessity to concentrate capital and practise economies of scale. From a rural-based, labour intensive, and locally-controlled industry based on selective logging, the trend is towards a more modern, centralized, mechanized, and outside-owned industry based on clear-cutting techniques which consume whole forests at an enormously increased rate. Changes are being effected via take-overs, amalgamations, and shutdowns encouraged by numerous industry and governmental reports, spurred on by mainland and overseas competition in forest products, and facilitated by Forestry Commission forest allocation decisions.

As the Tasmanian community and its peripheral economy have become stressed by fluctuations and re-adjustments in forestry activities, compounded in some areas by variable or declining agricultural fortunes

the role played by forestry in regional development or retention has been stressed to an increasing extent. In this respect, the woodchip industry is often cited as a prime example. For this reason, one of the major concerns of this thesis is to examine some regional effects of the industry. However, socio-economic effects are by no means confined to certain areas (especially in a state the size of Tasmania) but may have particular consequences for the State as a whole. In recognition of this, the following chapter will approach the industry from a state-wide perspective.

CHAPTER THREE

ASPECTS OF THE EXPORT WOODCHIP INDUSTRY IN TASMANIA

The export of pulpwood in the form of woodchips now represents the major form of timber production in Tasmania. Its position is a reflection of past and present trends towards more highly centralized and outside-owned forest industries. Nonetheless, the export woodchip industry (which now plays a role similar to that played by sawmilling in the past) is promoted as being a significant factor in regional development. Although this thesis will concentrate on a study of two particular regions for a detailed examination of the regional development hypothesis, the woodchip industry is a state-wide industrial undertaking. Through the granting of export licences by the Commonwealth Government of Australia and, in two cases, State guaranteed long-term access to Crown forests, three private companies have been able to profit from the Tasmanian export woodchip trade. The approach here will be to provide a profile of these companies and the means by which Crown forests have been allocated and managed by the State to cater for the corresponding levels of harvesting. In addition, another company obtains pulpwood primarily from private land, and its operations will also be discussed.

In allowing private companies to profit from export woodchipping, the State benefits largely through the creation of both direct and indirect employment. The quantitative and qualitative aspects of this employment are discussed in section 3.2. Other benefits in the form of company tax, sales tax and income tax have been largely omitted. The main factors behind this are the reluctance of those companies involved to disclose detailed financial information on their operations and the complexity of Commonwealth and State tax arrangements. Furthermore, examination of taxation benefits raises the question as to how much economic return the public should expect for extraction and processing of its own resources. Assuming Crown forests have a certain market value, are the taxation benefits from export woodchipping an adequate

economic return on that market value? This question requires economic analysis and theoretical discussion that are not within the scope of the thesis.

While employment benefits of the woodchip industry are readily identifiable, the role of the State in providing services and facilities for the industry is more difficult to ascertain. Levels of public expenditure have been obscured to a certain extent by the difficulty of obtaining accurate information and the reluctance of both government and industry to become heavily involved. Nonetheless, some information is available and the final section, 3.3, draws together various threads in order to discuss public expenditure on infrastructure associated with the export woodchip industry. This section complements the overall theme of the chapter; that is, who is involved in export woodchipping, how the resource is managed and exploited, the major benefit to the State and finally the major costs.

3.1 INDUSTRY DIMENSIONS

The establishment of an export woodchip industry in Tasmania resulted from an intensive world-wide search for unprocessed wood fibre on the part of Japanese trading companies during the 1960s. This search, prompted by expansion in Japanese pulp and paper manufacturing, led to the export of softwood chips from the American West Coast in 1964 which provided a working example for interested Australian groups (McCuaig 1981). In Tasmania, sawmilling interests, unable to dispose of mill wastes profitably, saw particular advantages in the industry and were amongst its earliest promoters. Industry support and encouragement was also provided by the Forestry Commission anxious to see growth in pulpwood industries as sawlog industries declined; growth on the scale envisaged would also strengthen its role in forest management. Industry approval was relatively easily obtained from local politicians respond-

ing to the possibilities of increased export earnings and regional employment. The possibility of further processing to pulp and paper and the need to rejuvenate old 'stagnant' forests were reasons used to justify the export of large quantities of unprocessed wood from Tasmanian forests (McCuaig 1981).

At one stage during the late 1960s, there were reported to be as many as eight groups attempting to establish export woodchip companies in Tasmania (McCuaig 1981). Three of these were ultimately able to secure adequate wood supplies and Commonwealth export licences: TPFH, APPM and Forest Resources.

3.1.1 The Companies

Since 1979, when TPFH became a wholly owned subsidiary of APPM, in practice only two companies have been involved in the export woodchip industry. However, due to the circumstances of establishment of TPFH, it is considered separately from APPM and in conjunction with Forest Resources. Some indication of the formation, ownership, and finances of the companies is given below.

(a) Associated Pulp and Paper Mills Ltd

Since commencement of paper manufacture at Burnie in 1938, APPM has grown to become a major force in the Tasmanian economy; $50 million is a company estimate of its direct annual contribution (APPM 1976). With a workforce of approximately 3800, it is the largest single employer in the State's private sector (Tasmania, State Government 1979). Incorporated in Victoria in 1936, the company has its head office in Melbourne. The two major shareholders are North Broken Hill Holdings Ltd (41%) and Carbonless Papers Pty Ltd (28%), a company wholly-owned by a number of British companies (APPM 1981).

The origins of APPM can be traced back to the failed attempts to

establish a pulp and paper industry in Tasmania during the 1920s. Key figures and events in the formation of the company, including the granting of exclusive rights to pulpwood and sawlogs through Acts of Parliament (Wood Pulp and Paper Encouragement Act 1924, and Associated Pulp and Paper Mills Act 1936), have been discussed by Meadows (1981) and Hoysted (1981).

Commercial paper production at the Burnie mill began in 1938. Paper production has risen from an initial 15 000 tonnes to 234 800 tonnes in 1980-81, with a corresponding, although fluctuating, increase in company profits (APPM 1981). Annual company reports show that $52 000 was lost in the first full year of production, while 1981 was a record year with an after-tax profit of $20.45 million. Over the period 1938-1981, the company has become a vertically integrated forests products company; it has progressively taken over a number of sawmills and the Somerset plywood mill as well as diversifying its paper production. In addition, the company has established a forestry and logging branch and undertaken the manufacture of compressed boards and furniture and the export of woodchips. Table 3.1 summarizes various financial and production trends over recent years. Both production and sales have increased steadily while net profits have grown quite sharply, particularly since 1979. A list of subsidiary companies is provided

TABLE 3.1

Recent trends in the operations of Associated Pulp and Paper Mills Ltd; 1977-1981[a]

	1977	1978	1979	1980	1981
Total external sales ($m)	179.38	200.90	235.86	316.64	368.46
Net profit for the year ($m)	6.84	9.92	17.44	15.13	20.45
Paper and wood-pulp production (tonnes)	237 824	253 468	283 068	319 613	334 528

[a] ASSOCIATED PULP AND PAPER MILLS LTD, 1981; *Annual Report 1981;* Associated Pulp and Paper Mills Ltd, Melbourne.

in Table 3.2. Major expansion occurred in 1971-72 with construction of the Long Reach woodchip mill and again in 1979 through the acquisition of Wiggins Teape Australia Pty Ltd in a share swap with the London-based parent company. Further expansion occurred in 1979 following the takeover of TPFH. It can also be seen in Table 3.2 that over 80% of the 1981 APPM group profit came from its Tasmanian operations; the combined contribution of the company's two woodchip enterprises to post-tax company profits in 1981 was somewhere between $4.5-5 million, or 25% of total group profits. This estimate confirms an earlier reported figure that APPM expected to earn between $2-3 million from its Long Reach operations (Higgins and Phillips 1973). The $4.5-5 million figure assumes that the Long Reach woodchip mill produces slightly more profit than the Triabunna mill.

APPM interest in woodchipping began as early as 1966. When the prospect of an export woodchip industry became apparent, APPM was in a strong position to participate since it already held large areas of Crown forest in north and north-eastern Tasmania which were not significantly in use for pulp and paper production. In 1970, the company finalized contractual arrangements with two Japanese firms Mitsubishi Shoji Kaisha Ltd and Sumimato Shoji Kaisha and Paper Company Ltd (Sanyo Pulp Company) and export of chips from Long Reach commenced in the following year.

(b) Tasmanian Pulp and Forest Holdings Ltd and Forest Resources

Both of these companies were founded for the express purpose of obtaining access to pulpwood to export as woodchips. Also, both were initially formed by local sawmillers but, in each case, control has passed to larger concerns. Forest Resources, formed initially by a group of northern sawmillers, is a business name under which Northern Woodchips Pty Ltd operates in Tasmania. The latter is a division of

TABLE 3.2

Associated Pulp & Paper Mills Ltd and Subsidiary Companies[a]

	Place of Incorporation	Associated Pulp & Paper Mills Ltd's beneficial interest	Activities	Contribution to 1981 group profit $'000
Associated Pulp & Paper Mills Ltd	Victoria		Listed holding company Manufacturer of fine papers, magazine printing papers and woodchips	11 701
Subsidiary companies				
Ballarat Paper Mills Pty Ltd	Victoria	100%	Holding company and non-operative	1
Ballarat Clay Co. Pty Ltd	Victoria	100%	Mining and production of clay	214
Papermakers Ltd	Victoria	100%	Property owning company	1
Wiggins Teape Australia Pty Ltd	Victoria	100%	Merchandising	1 750
W.T.A. (Holdings) Pty Ltd	Victoria	100%	Holding and management company	909
Wiggins Teape Shoalhaven Pty Ltd	N.S.W.	100%	Property owning company	21
Envelope Manufacturers Pty Ltd	N.S.W.	100%	Paper conversion	340
Associated Forest Holdings Pty Ltd	Victoria	100%	Forestry	1 205
Burnie Timber Pty Ltd	Victoria	100%	Holding company, timber milling and manufacture	1 574
Burnie Board Processors Pty Ltd	Victoria	100%	Non-operative	-
Tasmanian Plywood Mills Pty Ltd	Tasmania	100%	Manufacturer of plywood and veneers	34
A.E. Hilder Pty Ltd	Tasmania	100%	Non-operative	13
Tasmanian Pulp & Forest Holdings Ltd	Tasmania	100%	Manufacturer of woodchips	2 053
Kilndried Timber Industries Ltd	Tasmania	65.7%	Listed holding company investment company	254
Kilndried Hardwoods Pty Ltd	Tasmania	65.7%	Timber milling and manufacture	291
Pyengana Sawmills Pty Ltd	Tasmania	65.7%	Non-operative	-
Southern Hardwoods Pty Ltd	Tasmania	65.7%	Holding company, timber milling and manufacture	20
Derwent Valley Timber Company Pty Ltd	Tasmania	65.7%	Non-operative	-
Dee River Sawmills Pty Ltd	Tasmania	65.7%	Non-operative	-
Timpro Ltd	Tasmania	65.7%	Holding and property owning company	-
Fenton Timber Products Pty Ltd	Tasmania	65.7%	Timber products manufacture	6
I.C. Fehlberg Timbers Pty Ltd	Tasmania	65.7%	Timber milling	40
Galleon Timbers Pty Ltd	N.S.W.	65.7%	Timber merchandising	21
				20 448

[a] ASSOCIATED PULP AND PAPER MILLS LTD, 1981; *Annual Report 1981;* Associated Pulp and Paper Mills Ltd, 360 Collins Street, Melbourne.

H.C. Sleigh Resources Ltd a wholly owned subsidiary of H.C. Sleigh Ltd whose major shareholder is the Adelaide Steamship Company (48.5%) and Caltex Australia Ltd (12%) (H.C. Sleigh personal communication). The Adelaide Steamship Company's major shareholders are Australian interests and through its shareholding in H.C. Sleigh controls the board of directors (personal communication, P.Shepherd, Forest Resources 1982). Incorporated in Victoria in 1947, H.C. Sleigh Ltd is a large company with diverse interests ranging from food processing to natural resource development and transport (H.C. Sleigh Ltd 1981). As mentioned previously, in the case of TPFH the company became a wholly owned subsidiary of APPM in 1979.

The circumstances of the formation of TPFH by three prominent southern sawmillers in 1966 have been outlined by McCuaig (1981). The promoters' purpose was twofold: to secure a market for sawmill and logging residue and to obtain rights over uncommitted Crown land on the East Coast in order to gain sufficient supplies of pulpwood to support a woodchip industry. Impetus came from the realities of a declining sawmill industry experiencing market shrinkage, increased competition, and restrictions on log supply.

The northern sawmillers, initially grouped under the company name Tasmanian Wood Chips Pty Ltd, also in the late 1960s, were unable to obtain Crown land rights such as APPM had gained in 1961. They unsuccessfully attempted to gain access to APPM's Wesley Vale concession areas and then successfully resorted to private landowners as the sole suppliers for the woodchip project.

The southern sawmillers were successful in their bid for Crown rights and the first boatload of woodchips left the Triabunna chip mill of TPFH in April 1971 (Jones 1975). Purchase of the chips was made by the giant Japanese trading house Mitsui and Co. (Australia) on behalf of the Jujo Paper Company. The export price of $27A per

b.d.u. (bone dry unit) was used by the Commonwealth Government of Australia as the minimum guideline price for other export projects (Routley and Routley 1974). Since 1971, TPFH has shown a fluctuating increase in profitability. Available figures indicate that, while an initial loss of $196 024 was sustained in 1970-71, by 1975-76 a profit of just over one million dollars was made (TPFH 1971, 1976). The estimated price paid for the company by APPM in 1979 was $27 million, some $20 million in excess of the net assets of TPFH (Kellow unpublished). This latter figure represents the then current market value of the company's pulpwood rights. It also represents the extent to which private profit can be made, in this case by sawmilling interests, from what effectively amounts to the sale of public forests.

The northern sawmillers arranged a $100 million contract with the Japanese Pulp and Paper Association in late 1968 but were refused a Commonwealth export licence due to the low chip price which had been negotiated. When negotiations with Japanese interests and further applications to the Government both proved unsuccessful, a new company, Northern Woodchips Pty Ltd (Tasmanian Woodchips Pty Ltd 40%, Plantation Management 40% [a subsidiary of the Savoy Corporation], and Japanese interests 20%) was formed (Jones 1975). This company was able to satisfy Commonwealth requirements with a new contract negotiated with Yamamoto Sangyo Company Ltd on behalf of the Taio Pulp and Paper Company. Following the collapse of the Savoy Corporation, the company experienced difficulties in raising the necessary capital to complete mill construction. Bankruptcy was avoided only through intervention by H.C. Sleigh Ltd and the Australian Industry Assistance Commission in 1971 (personal communication, Forest Resources 1981). By the time the first consignment of woodchips from the company's Long Reach mill left for Japan in November 1972, the major shareholders included H.C. Sleigh Ltd 32% and the Australian Industry Assistance Commission

20%. H.C. Sleigh Ltd increased its holding to 99% in 1977. This company has also diversified its forest-based activities through the takeover, in 1980, of Tasmanian Board Mills Ltd, the State's largest sawmill. Forest Resources bid unsuccessfully against APPM for ownership of TPFH in 1979.

There is little publicly available information on the profitability of Forest Resource's operations. However, in 1981, the company contributed $6.767 million to H.C. Sleigh's consolidated profit (before tax and other deductions), making it the single largest contributor (H.C. Sleigh Ltd 1981).

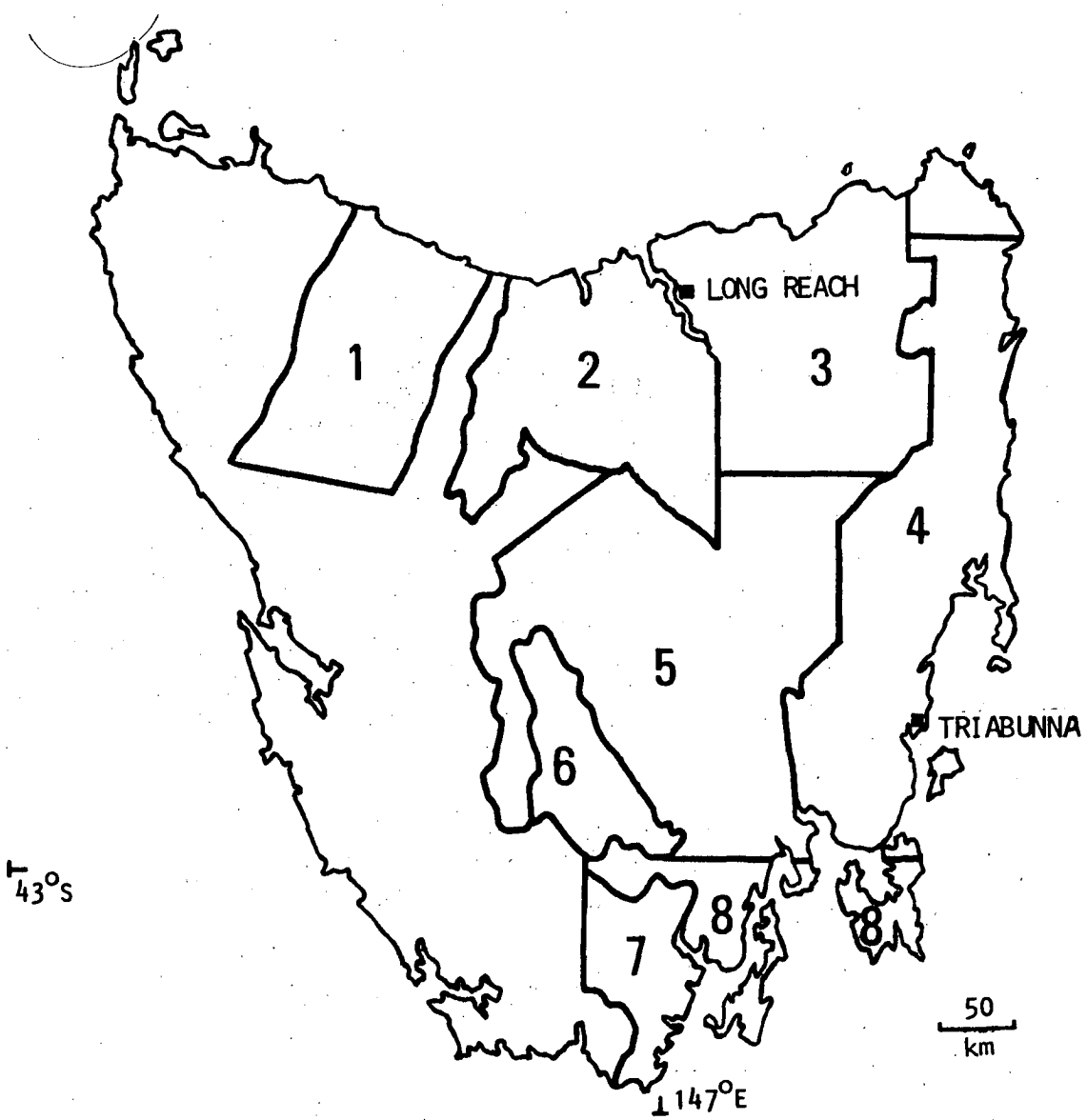
The information presented here on the evolution of each company and the private profits which have been made from the woodchip industry suggest that export woodchipping has proved quite lucrative for the companies involved. Annual net profits average between $2-3 million for each company; this is on a capital investment ranging from $8-12 million for each mill and associated works (Lembke 1972, 1973, 1973a). A major factor in attaining such profitability has been the ability to secure exclusive rights to wood from state and private forests. The following section describes aspects of these pulpwood sources.

3.1.2 Harvesting and Management of Woodchip Concessions and Private Forests

From earlier this century, the concession system has been the dominant form of forest allocation for large pulpwood industries in Tasmania. Concessions are specified by Acts of Parliament and are areas of public land over which the holder is granted significant long-term rights (see Figure 3.1). The concession system was initiated in Tasmania specifically to encourage the establishment of a pulp and paper industry. Although each succeeding Act has imposed slightly greater obligations upon the holder, the fundamental purposes of the

FIGURE 3.1

Tasmania: Concession areas and location of woodchip mills[a]



Concession Areas

1. APPM Burnie Concession
2. APPM Wesley Vale Pulpwood Area
3. APPM Wesley Vale Reserve Area
4. TPFH Pulpwood Area
5. TPFH Reserve Area
6. ANM Concession
7. APM Pulpwood Area
8. APM Reserve Area

[a] AUSTRALIAN BUREAU OF STATISTICS, 1980; *Tasmanian Year Book;* Government Printer, Hobart.

system have altered little since its inception; the intention of government, as stated in each Act of Parliament, is basically to attract industry, to maintain industry by ensuring resource security and, theoretically, to provide incentives for industry expansion. Although not a major form of forest allocation in other Australian states, the concession system has been doggedly supported by its beneficiaries as a long-term guarantee essential for investment in pulpwood processing.

Legislative provision made for the woodchip industry can be seen as a predictable extension of past forest allocation in Tasmania. Both woodchip operations of APPM have exclusive rights to all pulpwood in the respective concession areas, each guaranteed by Acts of Parliament. In the case of Forest Resources, access to pulpwood from State forest in north-western Tasmania was acquired in 1980 and some salvage sales are also made but, primarily, the company obtains pulpwood from private property. The other two companies also obtain wood from private property but on a much smaller scale. The operations of all three companies will be examined in turn to show how much forest has been apportioned to each, to indicate the rate at which this resource is being harvested and finally, to discuss the provisions made for forest management. Table 3.3 summarizes particulars of the concession areas, export licences, pulpwood sources, and forest management. This table will form the backbone of the following discussion.

(a) Wood Use by Associated Pulp and Paper Mills Ltd

This company obtains Crown pulpwood for export as woodchips from its Wesley Vale pulpwood and reserve areas, as well as from the north-western licence area. The concession areas are outlined in Parts I and II of the first schedule of the Wesley Vale Pulp and Paper Industry Act 1961 and, as can be seen from Figure 3.1, cover an extensive area

TABLE 3.3

Details of the export woodchip concession areas, export licences, pulpwood sources and forest management as supplied by the Forestry Commission

	Associated Pulp & Paper Mills Ltd	Tasmanian Pulp & Forest Holdings Ltd	Forest Resources
Area of pulpwood concession	221 800 ha	313 400 ha	-
Area of reserve	282 500 ha	246 400 ha	-
Concession Tenure	80 years	80 years (if mill established by 1988)	-
Area of Crown forest in pulpwood concession	134 800 ha	281 000 ha	-
Area of Crown forest in reserve	208 400 ha	136 000 ha	
TOTAL	343 200 ha	417 000 ha	
Initial export licence	610 000 tonnes to 1983 305 000 tonnes to 1978	710 000 tonnes (1971)	711 000 tonnes
Increases in export licence	150 000 tonnes 1/1/80 to 30/12/85	102 000 tonnes 1/1/80 to 31/12/88	142 000 tonnes 1/1/80 to 31/12/86 94 000 tonnes 1/7/80 to 30/6/85
Current export licence	1 065 000 tonnes	812 000 tonnes	947 000 tonnes
Maximum allowable pulpwood cut on Crown land	496 000 tonnes (Wesley Vale) 180 000 tonnes (North West)	Initial allowance 508 000 tonnes From 1/1/80 614 000 tonnes	100 000 tonnes dead wood North 120 000 tonnes green wood West
Sources of the allowable cut:			
Pulpwood concession)	60%	63%	-
Reserve area)		13%	-
Private property	10%	24%	82%
Other Crown land	30%	-	18%
(Approximate percentages, assuming export licences are met)		From F.C. letter	From F.C. Report
Forest Management[a]			
Fire protection	Forestry Commission	Forestry Commission	All forest management is conducted by the company, as operations are largely conducted on private land
Roading	Some by APPM - balance by F.C.	TPFH	
Regeneration	Forestry Commission	Forestry Commission	
Maintenance	Forestry Commission	Forestry Commission	
Pulpwood rights	Exclusive rights to all species	Exclusive rights to all eucalypts	-

[a] BOWMAN, D.M.J.S., 1981; The use of Tasmanian Forests, *Wilderness* 17, 8-11.

of just over 500 000 ha in north-central and north-eastern Tasmania. The 1961 Wesley Vale Act is typical of more recent forestry legislation in that forest management is placed in the hands of the state, rather than private interests. Thus, forest management, in the form of regeneration, maintenance, silvicultural research and fire protection, are carried out by the Forestry Commission. Road construction and maintenance are shared between the company and the Commission (see Table 3.3).

The pulpwood and reserve areas, originally requested in 1936, were finally granted on the condition that at least £300 000 be spent in establishing a pulp and paper mill at Wesley Vale (Hoysted 1981). The site was prepared in anticipation of a major export-orientated chemical pulp industry (APPM 1981). However, an oversupply of pulp on world markets, in conjunction with economic difficulties, have been described as preventing expansion from the one small pulp mill, one paper mill, and a coater which began operating at Wesley Vale in 1970 (APPM 1981, 1981a). Although feasibility studies on the viability of a major pulp plant have been conducted since 1974, no positive action has been taken. The most recent study in 1980 was done in conjunction with representatives of the pulp and paper industry in Japan.

The delay in commencement of the lower-than-planned level of manufacturing at Wesley Vale found APPM throughout the 1960s, incompletely exercising its exclusive rights to Crown land pulpwood from the Wesley Vale concession areas. From a forest management perspective, the pulpwood and reserve areas were under-utilized. In 1967, APPM began to seek Government approval for the export of this pulpwood in the form of woodchips as an interim measure until further expansion of pulp and paper-making took place at Wesley Vale. That approval for such a change in forest utilization was granted, even before the intention of the 1961 Act was fulfilled, highlights the inadequacy of the

concession system in achieving its professed goal of attracting and developing a major manufacturing industry based on the forest estate.

From Table 3.3 it can be seen that APPM's Long Reach mill is licensed to export a maximum of 1 065 000 tonnes of pulpwood until 1985; of this, a maximum of 676 000 tonnes is available from Crown land (Wesley Vale, North West and TPFH pulpwood area) while the remainder comes from private forests, including the company's 107 172 hectare freehold block in North West Tasmania. Since the largely financial obligations of the 1961 Wesley Vale Act have been satisfied, the company currently holds pulpwood rights over Crown lands of the Wesley Vale concession areas until the year 2042.

There are some 416 000 ha of forested area in the Wesley Vale concession area (Walker 1981). The area of commercial quality eucalypt forest available for logging has been assessed at 218 600 ha (see Table 3.4). In order to calculate the rate at which this area can be harvested for pulpwood and sawlogs for the duration of concessional rights (the 'maximum sustainable yield'), the Forestry Commission incorporate data on such variables as age classes, site indexes, and volumes per hectare, to estimate

(a) merchantable yields from regrowth forests (existing and future),

(b) total merchantable volumes in existing oldgrowth forests, and

(c) the necessary rate of oldgrowth cutting to cover the period required to bring regrowth forests to 'substantial productivity' (McMurray 1981).

Under Section 22 of the Forestry Act 1920, the Forestry Commission is charged with the duty to provide working plans (containing such calculations) for areas of Crown forest dedicated as State forest.

TABLE 3.4

Areas of commercial eucalypt forest in the Wesley Vale Concession of Associated Pulp and Paper Mills Ltd[a]

APPM Wesley Vale	Eucalypt oldgrowth (ha)	Eucalypt regrowth (ha)	Total Eucalypt (ha)
Pulpwood Concession	105 800	22 200	128 000
Reserve Area	164 200	30 700	194 900
Both areas	270 000	52 900	322 900[b]

[a] TASMANIA, STATE GOVERNMENT, 1979; *Submission to the Senate Standing Committee on Trade and Commerce Inquiry: Forestry and Forestry Based Industries*, Appendix 3-1; Government Printer, Hobart.

[b] This final figure includes 104 300 hectares of commercial forest that is currently unloggable, largely due to topography (Walker 1981). Currently there are 218 600 hectares of commercial forest available for logging in the Wesley Vale concession and reserve.

However, as yet, no working plan has been published for the Wesley Vale area, although plans for the southern Tasmanian concessions of APM and the East and Central concession areas of TPFH were published in the Tasmanian Government Gazette at the beginning of their operations. A draft working plan prepared in 1961 and subsequently amended in 1968, was not gazetted. Although forest classification has continued since 1968 gaining a composite picture of the forests, by 1982 the Forestry Commission (personal communication) was "...still determining the sustainable pulpwood production per annum and thus these data are not yet available."

In other words, after 21 years of operation, a period which has witnessed a six-fold increase in pulpwood production throughout Tasmania, the Forestry Commission has yet to finalize the annual rate at which the 218 600 hectares of commercial forest in the Wesley Vale concession areas can be cut on a sustained yield basis. That this woodchip area is not being adequately managed, in the sense that the level of cutting is not based on a finalized assessment of the resource, was indicated recently by the Tasmanian Government (1979) when it concluded that "The corresponding harvest of pulpwood is set in accordance with export agreements for woodchips."

In this case biological constraints on forest harvesting (the basis of forest management practices) appear to be considered of secondary importance to the requirements of export agreements. This observation is further supported by discrepancies between the Forestry Commission's public statements about management of the resource and the company's actions. The maximum allowable pulpwood harvested from the Wesley Vale pulpwood and reserve areas is 496 000 tonnes per annum (see Table 3.3). This figure is an initial estimate calculated on a sustained yield basis by the Forestry Commission. According to information supplied by APPM (personal communication 1982) approximately

575 000 tonnes of pulpwood were harvested for export in 1982. The discrepancy suggests that State forests in the Wesley Vale pulpwood and reserve areas are not being managed on a sustained yield basis.

Table 3.5 is a preliminary schedule for the harvesting of pulpwood from the Wesley Vale pulpwood and reserve areas over the next 110 years. It can be seen that for the first 40 years, a large proportion of the pulpwood to be harvested will come from old-growth froests. From 2030 onwards, regrowth forests currently being sown will replace oldgrowth and old regrowth forests (the Forestry Commission (1974) defines a regrowth tree as one less than 110 years old). Between 1980 - 2030, approximately 24 million cubic metres of pulpwood will be harvested from 218 600 hectares of commercially accessible forest. Further pressure will be placed on those forests currently

TABLE 3.5

Wesley Vale Concession: Planned cuts of pulpwood on integrated area[a]

Years	Forest Classification			Total
	Old Growth '000 m^3	Old Regrowth '000 m^3	Regrowth '000 m^3	
1980-89	468	19		487
1990-99	402	82		484
2000-09	380	93		473
2010-19	368	112		480
2020-29	232	242		474
2030-39		132	336	468
2040-49			502	502
2050-59			613	613
2060-69			617	617
2070-79			689	689
2080-89			603	603
TOTAL	18 500	6800	33 600	58 900

[a] TASMANIA, FORESTRY COMMISSION, 1982; personal communication. The area includes up to 50% slope.

inaccessible (some 104 000 hectares, due almost entirely to topography) through improved harvesting techniques (Walker 1981). Overall, it is envisaged that, over the 110 year period of the draft working plan, some 60 million cubic metres of pulpwood will be harvested from currently commercial forests in Wesley Vale concession areas.

A final point should be made in respect of APPM's woodchip operations in North West Tasmania. An export licence increase of 150 000 tonnes was granted to APPM in 1980 following agreement with the Forestry Commission that the level of pulpwood cutting in the far North West of the State would also be raised. This area (see Figure 3.1) lying outside concession boundaries contains a large proportion of rainforest, often with emergent or adjacent eucalypts, and it would seem that the Forestry Commission is attempting to take advantage of the woodchip market to convert these forests to commercial eucalypt stands. As a consequence, from 1980, the proportion of rainforest timber (mostly myrtle) exported as woodchips by APPM rose to approximately 8% of the total. However, much myrtle is left behind; more importantly, large areas of rainforest are being destroyed in regeneration burns after eucalypt extraction. In this sense, the woodchip industry acts as the vehicle by which the extensive areas of cool temperate rainforest in north-western Tasmania are being replaced by commercial eucalypt forests.

(b) Wood Use by Tasmanian Pulp and Forest Holdings Ltd

This subsidiary of APPM obtains pulpwood from 559 800 hectares of Crown land in eastern and central Tasmania as specified in the Pulpwood Products (Eastern and Central Tasmania) Act 1968 (see Figure 3.1). The dry open forests of the pulpwood area covering most of Tasmania's East Coast are generally low-yielding and have often been described as 'degenerate' and of little value. The establishment of a woodchip

industry based on these forests was promoted as a means of implementing proper forest management in order to increase the commercial value of a previously neglected and rundown forest type (McCuaig 1981). The Forestry Commission, in co-operation with a consulting firm engaged by TPFH, spent at least a year in assessment of the ability of these forests to support a woodchip industry (McCuaig 1981). The results were positive and the company was granted an initial right to obtain 7.5 million tonnes of pulpwood from the pulpwood area, plus some logging residues from the reserve area, for the period 1 October 1970 to 1 October 1988. The 1968 Act specifies that, if a pulp and paper mill is established by 1985, the company will be given a long-term (80 year) right to obtain pulpwood from both the pulpwood and reserve areas. If this obligation is not fulfilled, or is found to be unfeasible, then a "continuation" right may be implemented whereby (subject to terms and conditions agreed to by the Minister for Forests and the company) TPFH may obtain pulpwood from the pulpwood area with restricted access to the reserve area. In practice, however, this reserve area has already been made available to the company to fulfil certain Forestry Commission management objectives. Certainly the long-term right as defined in the 1968 Act is unlikely to arise since feasibility studies have stressed the lack of suitable quantities of water for pulp and paper manufacture at Triabunna (personal communication, K. Henry Mill Manager - TPFH 1981). Furthermore, following the take-over of TPFH by APPM, any further expansion of pulp manufacture by the latter will undoubtedly occur at Wesley Vale (APPM 1982). Despite this, it seems more than likely that APPM will have little trouble in obtaining continuation rights over the Eastern and Central forests for the continued operation of an export woodchip industry at Triabunna. It would seem that the rationale behind the setting up of reserve areas as an enticement for further manufacturing has failed with respect

to the Wesley Vale district and the East Coast. Both reserve areas are being taken over for export woodchipping.

The area of commercial eucalypt forest in both the pulpwood and reserve areas is approximately 331 500 hectares (Table 3.6).

TABLE 3.6

Areas of commercial eucalypt forest on Crown land in the Tasmanian Pulp and Forest Holdings Ltd Concession Area & Reserve[a]

	Eucalypt oldgrowth & regrowth (ha)	High quality milling timber (ha)	Milling timber & pulpwood (ha)	Pulpwood & milling timber (ha)	Mainly pulpwood forests (ha)
Pulpwood Area	316 500	12 500	35 000	50 500	114 000
Reserve Area	260 500	8 500	32 500	37 000	41 500
Total	577 000	21 000	67 500	87 500	155 500

Total area of eucalypt forest assessed = 577 000

Area of commercial forest = 331 500

Total area available for logging = 230 500

[a] TASMANIA, FORESTRY COMMISSION, 1978; *Financial Analysis: Forestry Commission Operations in Concession of T.P. & F.H.*; Government Printer, Hobart.

Excluding non-forested or inaccessible areas, approximately 230 500 hectares are available for clearfelling. Also, from Table 3.6, it can be seen that areas of forest classified as pulpwood quality make up a large proportion of this area, while high quality milling timber has a much more restricted distribution. The Forestry Commission intend to reserve these latter areas to provide future milling timber. According to the 1972 Working Plan, the calculated maximum sustainable yield requires the clearance and reforestation of an average area of 5750 hectares per annum on a 40 year rotation cycle (Tasmania, Forestry Commission 1972). The potential sustained pulpwood yields as estimated in this plan are shown in Table 3.7. The maximum annual cut for the

TABLE 3.7

Potential sustained pulpwood yields from the Tasmanian Pulp & Forest Holdings Ltd Pulpwood Concession Area & Reserve Area[a]

Years	Pulpwood Area '000 tonnes	Reserve Area '000 tonnes	Total '000 tonnes
1-2	255		255
3-10	510		510
11-20	510		510
21-30	350	160	510
31-40	350	160	510
41-50	400	210	610
51-60	400	210	610
61-70	430	180	610
71-80	430	180	610
Total Potential Production	33 290	11 000	44 290

[a] TASMANIA, FORESTRY COMMISSION, 1978; *Financial Analysis: Forestry Commission Operations in Concession of T.P. & F.H.*; Government Printer, Hobart.

first 40 years is 510 000 tonnes, increasing to 610 000 tonnes annually for the following 40 years. These estimates assume that the reserve area will be available for full production as soon as the initial right has expired. When this occurs, harvesting of the pulpwood concession will decline sharply as pulpwood is obtained from the reserve area.

Prior to 1980, TPFH cut about 450 000 tonnes annually from the East Coast pulpwood area, with a further 50 000 tonnes of sawlog residues being obtained from sawmills in the reserve area. According to the Forestry Commission, the need to reduce a backlog of sawlog residues in the reserve area led to an increase in export licence in January 1980 which allowed the company to take 106 000 tonnes annually from the reserve area as well as a maximum cut of 508 000 tonnes from the pulpwood area (Tasmania, Forestry Commission personal communication

1982). The balance of the export licence, up to 200 000 tonnes, is obtained from private property.

Planning and management, regeneration, and protection of Crown forests in the TPFH concession areas are the responsibility of the Forestry Commission. The Commission is also responsible for a limited amount of roading (mainly for plantations) although most is done by the company. These roads are maintained by the Commission once they have ceased to be used for logging. With only a limited amount of sawlogs being cut in these areas, most of the time and resources expended by the Forestry Commission on the East Coast are devoted to pulpwood production for the export woodchip trade.

(c) Wood Use by Forest Resources

As indicated in section 3.1, this company has no long-term guaranteed access to public forests. Through a concerted approach to landowners, especially in the late 1960s, Forest Resources was able to secure a supply of pulpwood from private forests. These forests are quite extensive, occupying about one million ha of the estimated 2.78 million ha of forested land in Tasmania (Everett and Gentle 1977). Approximately 80% are located in north-eastern and central Tasmania and are therefore quite accessible to the three woodchip operations. Although each company derives pulpwood from private forests, Forest Resources is by far the major user of wood from this source.

In 1980-81, 752 000 tonnes were obtained by the company from private land (Tasmania, Forestry Commission 1982). On a statewide basis, 1.554 million tonnes of pulpwood were harvested from private land in the same year, representing 43% of the total pulpwood cut for 1980-81 (Tasmania, Forestry Commission 1982). Although a certain percentage of the pulpwood cut from private land is used in pulp and paper manufacture, most of the cut (perhaps 80-85%) was exported in the form

of woodchips. Herein lies a major dilemma confronting forest management in Tasmania. The woodchip industry has provided a means by which landholders can clear forested land for either grazing, on a break even basis, or as a once-only operation with no attention to further development. Tax disincentives (Everett and Gentle 1977), and the relative economic advantage of grazing over timber production have meant that, between 1970-78, approximately 5800 hectares of private forest were lost annually to agriculture while, over the same period, only 2700 hectares per annum were regenerated (Walker 1981). Since that time, the rate of annual native forest regeneration has increased to about 4500 hectares and that of private plantation establishment to 3500 hectares (on mainly industrial, but including non-industrial, lands) (Quick 1982). Although the Forestry Commission views this trend as "maintaining the private forest estate" (Quick 1982), it remains to be seen as to what impact this trend will have in the long-term.

Through the analysis of satellite imagery, Kirkpatrick and Dickinson (1982) have been able to estimate the rate of conversion of native vegetation to agricultural purposes in Tasmania for the period 1972-80. The results indicate that 74 000 ha of native vegetation, or 9250 ha each year, were converted to improved pasture. Most of this area was originally dry open forest of eastern and north-eastern Tasmania in close proximity to both export woodchip ports. These figures suggest Forestry Commission estimates to be over-optimistic and led Kirkpatrick and Dickinson (1982) to conclude that "...it may be safer to assume that 40% of the total private forest estate will be converted to pasture, than to expect private forest diminution to cease."

The operations of Forest Resources have contributed significantly to this situation. The Federal Government granted an initial export licence of 711 000 tonnes with the proviso that the company regenerate

2000 ha annually from 1977 onwards. A quota increase of 236 000 tonnes was granted in 1980 on the condition that, of the 2000 ha established, 500 ha would be eucalypt plantation (Walker 1981).

In 1979, Forest Resources entered into a contract of sale agreement with the Forestry Commission involving the harvest of 220 000 tonnes of pulpwood per annum (for 6-7 years) from State forests in the far North West of Tasmania. Although the Commission stated that this arrangement was sought in order to defer cutting of standing timber on private property while forest residues and fire-killed trees were not being fully utilized in the North West (Tasmania, Forestry Commission 1981), it does not seem as though the sale was intended to actually lower the prevailing level of cutting on private land since Forest Resources' export quota was increased by 236 000 tonnes in the following year, 1980. Again, as in the case of APPM, it appears that the Forestry Commission is intent on taking advantage of woodchip operations for forest management purposes, involving the conversion of rainforests to commercial eucalypt stands in the North West.

In addition to this temporary North West source, Forest Resources has pulpwood rights to some areas of Hydro-Electric Commission land and may undertake salvage operations from such locations as the now-filling Pieman River storage. Short-term access to Crown forests in the North West and in the above case, do not represent a secure resource base for future operations. Walker (1981) has noted that "Industrial ownership of private forests is likely to increase as companies seek to secure a firm base for future activities."

Forest Resources currently owns 24 000 hectares of land (personal communication, P.Shepherd,Forest Resources 1982). Acquisition of private property, however, has not been the only means by which companies have consolidated their resource base. In conjunction with the Private Forestry Division of the Forestry Commission, both Forest Resources and APPM have, since 1978-79, begun to promote their interests by offering

forest management advice and financial incentives to landowners for forest regeneration. For example, land owners entering into a contract with Forest Resources can have up to 80% of regeneration costs paid by the company in association with financial support from the Private Forestry Division of the Forestry Commission (personal communication, P.Shepherd,Forest Resources 1982). Through this scheme, up until the end of 1981, Forest Resources has been involved in the regeneration of some 10 000 hectares of forest on private land. However, even if the economics of timber production improve, it would be virtually impossible to match regeneration to clearance on private land not owned by the actual companies themselves. This is partly reflected in the fact that up until March 1980, 88% of all private plantations (for hardwood and softwood) were on land owned by forest-based industries (Quick 1982). Clearly, from the farmers point of view, the financial incentives of plantation forestry are not adequate to justify investment. This reinforces Kirkpatrick and Dickinson's (1982) observation that private forest diminution can be expected to continue.

3.1.3 Conclusion

This overview of woodchip companies, pulpwood sources, and rates of harvesting shows some important features of the industry. Initially, two companies, TPFH and Forest Resources, were formed expressly to take advantage of the newly arisen export trade in woodchips. Although local industrialists were involved in the early stages, both companies have since been drawn into much larger, more influential corporate bodies. APPM controls virtually all the export of pulpwood from Crown forest and, in total, is responsible for the export of up to 1 877 000 tonnes of woodchips from the State (two-thirds of the total volume). This company has used the woodchip industry to extend and consolidate even further its control of the forests and forest industries

of Tasmania. Unlike other companies, it had reasonably easy access to pulpwood from an existing concession and embarked on woodchipping as a profitable stop-gap measure until pulp and paper prospects improved. Legislation covering both woodchip concessions has as an ultimate objective the establishment of pulp and paper industries but, as witnessed by events in the Wesley Vale concession, this legislation cannot guarantee the sought-after level of industrial expansion but allows for opportunistic development by industry. With the acquisition of TPFH by APPM in 1979, the prospect of a pulp and paper industry on the East Coast disappeared.

Export licence increases in 1980 were used by the Forestry Commission to extend access to more remote North West forests and to increase the eucalypt component of these forests. Such increases do not appear to have significantly lowered the cut on private land which is of particular concern since, in the past, the level of regeneration was very low and even though this has now risen, the increase is largely due to regeneration on land owned by the companies rather than greater reforestation efforts by farmers and graziers.

In all, a maximum of nearly 1.5 million tonnes of pulpwood from public land is committed to export woodchip industries. This has been accepted by the State government as being for the purposes of forest management and social benefit. The most immediate benefit recognized is employment and this aspect of the industry is now examined.

3.2 EMPLOYMENT ASPECTS

Employment is the main benefit which Tasmanians receive from the three export woodchip operations. Although there are some differences, each operation entails essentially the same range and organization of employment. For the purposes of this discussion three main categories of employment have been recognized as follows:

(a) the managers of independent logging and cartage businesses (prime contractors and sub-contractors),

(b) the employees engaged directly by each company (staff, mill workers, and some drivers) and by contractors (bush workers and drivers),

(c) people employed in activities closely associated with the industry (Forestry Commission employees and those in industry services).

Together, these people are most closely involved in the production of woodchips for export. Although some may also partly be engaged in the handling of sawlogs, in this study the first two categories are considered to make up direct woodchip employment. This approach is more realistic than confining discussion of direct employment to woodchip mill workers (as would be the case if the Australian Standard Industrial Classification were used). Although only mentioned briefly here, additional employment is also generated by the spending of employees in all three categories. The size and nature of both categories of direct woodchip employment will be detailed, while associated employment will be described more generally in terms of types and numbers of jobs. Differences in employment between the operations of the three companies are also examined.

3.2.1 Logging and Cartage Contractors

Contractors are engaged in logging and cartage for the industry and also in some forest road construction. The contracting system, in which a fluctuating number of small firms operates, stems from the historical organization of the State's sawmilling industry.

The most important link between chip mill and forest is through the prime contractor. These people are required to "fall, drag, load and deliver" (personal communication M. McCulloch, East Coast

contractor 1981) to the mills a certain weight (a quota) of pulp logs per day, averaged over a fortnight. Generally, these agreements are only verbal and quotas may be altered at any time according to the requirements of chip companies. Prime contractors' operations vary in size and organization. Most sawmillers with rights to logs from Crown land in woodchip concession areas are also contracted to supply pulpwood. An average prime contractor hires or leases several pieces of heavy logging machinery (perhaps a skidder, dozer, and loader) and employs three to four men to fall the trees and operate this machinery.

Areas of up to about 400 ha are clearfelled for pulpwood and any available sawlog (however, if there is insufficient demand for sawlogs, no distinction is made). This area, a "coup", may be worked by one or several contractors depending on the size of their operations. The amount of wood left in the forests by contractors in an average clearfelling operation on Crown or private land may be of the order of 150 tonnes per hectare (personal communication P.Shepherd, Forest Resources 1981).

Forest Resources is alone in employing two types of contractors: long-wood and small-wood contractors. Small-wood contractors only operate on private land which is to be replanted. Here, they move through forests previously logged by long-wood contractors and, using different types of machinery to long-wood contractors collect smaller diameter wood which would otherwise be burnt in the regeneration fire. Forest Resources claim to harvest at a rate 40% higher per hectare than other companies and, in areas to be regenerated, to leave logging residues of the order of only five tonnes per hectare. Small-wood contractors have been found to operate economically within a radius of some 150 km of the chip mill at Long Reach; so far, operators have worked as far afield as Lake Leake, Pyengana, Beulah, and Campbell Town. Several railhead contractors are also engaged in the transfer of logs from trucks to trains for transport from the north west and south of the

State to Long Reach (personal communication P.Shepherd 1981).

In some cases, prime contractors also own one or more log trucks and employ drivers to deliver their quota, but the most common arrangement is to sub-contract delivery through an owner-driver or small cartage firm (except in the case of APPM which is described in the following sub-section). Some people who own a piece of logging machinery such as a skidder may also sub-contract for a prime contractor.

Where the companies are required to undertaken road construction in order to gain access to forest or upgrade existing roads for log transport, local councils often are engaged as contractors.

The approximate numbers of prime contractors and cartage sub-contractors engaged in the woodchip industry in 1981-82 are shown in Table 3.8.

Prime contractors are allocated quotas depending on mill requirements and also according to the size of their operations and ability to organize men and finance. When the industry began, the companies were besieged with applications for contracts from people with and without experience. Most contractors who were engaged had some previous experience in either the sawlog or pulpwood industry. Some small farmers also took on contracting as a sideline. Unlike the other companies, Forest Resources granted self-logging rights to those farmers who sold pulpwood from their land even if they were not contractors. In the case of TPFH, most contractors received initial quotas of between 50-160 tonnes per day while the biggest contractors began on 300-350 tonnes per day (personal communication M. McCulloch and N. Vance, ex-TPFH logging supervisor). Many men who began with a small 50 tonne quota were able to build up to 120 tonnes, but others have had problems with men and money. Some who expanded quickly in the first few years in response to the great demand for woodchips were in great difficulty by 1974-75 when a slump in demand occurred. At that time, many

TABLE 3.8

Woodchip industry logging and cartage contractors

Associated Pulp and Paper Mills Ltd[a]	
Prime contractors - Wesley Vale	36
- far North West	~ 7
Cartage contractors	~ 20
Tasmanian Pulp and Forest Holdings Ltd[b]	
Prime contractors	31
Cartage contractors	~ 60
Forest Resources[c]	
Prime contractors - long-wood	41
- small-wood	13
Railhead contractors	4
Casual contractors	(10)
Cartage contractors	44
Casual cartage contractors	(6)
TOTAL (excluding casuals)	~ 256

[a] GRANT, D.W. (Forest Manager, APPM), 1982; personal communication. Numbers as of August 1982; does not include sub-contractors employed by sawmillers.

[b] HENRY, N.K. (Mill Manager, TPFH), 1981; personal communication. Numbers as of November 1981.

[c] SHEPHERD, P. (Forest Resources), 1982; personal communication. Numbers as of August 1982.

contracts were cut by 50% and the chip mills stopped accepting logs for periods of up to two-four weeks at a time (Jones 1975). During this downturn, all contractors who were not dependent on the industry were put off, including part-time farmers. Some dependent contractors, usually the smallest, were also dismissed (personal communication N. Vance). Grant (1979) emphasized the need for forestry projects to maximize benefits to the pre-existing rural population by ensuring that local employment needs are given priority but, in the case of farm contractors, the woodchip industry has not always succeeded in this respect.

In 1981, many East Coast contractors were working on 120 tonnes per day while, at that time, a quota of 150-180 tonnes was considered by prominent members of the industry to be the minimum required by an average operation. It has been suggested that, although a small number of contractors engaged by each company are doing very well, since early 1981, most have been working on the minimum viable volume and have only just been able to manage (personal communication P.Shepherd 1982).

The situation with cartage sub-contractors has been far more volatile. This occupation is still seen as the most independent and adventurous in the industry and is consequently that which most people seek to enter. However, since early 1981, virtually no new cartage contractors have joined the industry. In the early 1970s, an old farm truck provided a common means by which a person with a rural background could set up a cartage business; this was later traded in for a more modern second-hand rig by mortgaging the family home. If no major mechanical breakdown was experienced within the next two years, that truck would in turn be traded in, ideally, on a new vehicle (personal communication D. O'Brien, ESANDA finance officer). Although difficult to quantify, many hauliers found themselves both undercapitalized and unlucky in their early years of carting and, accompanied by

some internal industry re-organization, the 1974-75 downturn exacerbated this situation (personal communication D. O'Brien and N. Vance).

As previously mentioned, cartage contractors are engaged by prime contractors to deliver logs to either mill or railhead. Following a dispute at the TPFH mill in the mid 1970s in which hauliers claimed to have been underpaid by contractors, the company took over payment of hauliers although contractors retained powers of hiring and firing. At the Long Reach mills this arrangement has not been found to be necessary. APPM exercises strict control over transactions involving logging and carting machinery; in some years, the company has threatened contractors with dismissal if they were to buy new machinery (personal communication P. Shepherd). Presumably, this action has been taken to enhance stability and continuity of wood supply to the woodchip mill.

The East Coast log hauliers have been, perhaps, the most militant workers in the industry. In 1979, an incident involving a Department of Labour and Industry directive to a contractor to repair some machinery escalated into a demand for higher haulage rates and led to a blockade of the chip mill. Hauliers gained several pay increases following this action and also a structuring of cartage rates which previously had been uniform. As a result, in 1982 there were 27 different rates applicable to East Coast drivers each dependent on the length of haul, quality of road, and whether or not the load of logs had been segregated into logs of >85 cm or <85 cm diameter (personal communication M. McCulloch). The rates ranged from approximately 6.5¢ per tonne kilometre to a maximum of 8.5¢ per tonne kilometre for a long haul from the Gordon River road to Triabunna (personal communication East Coast log haulier 1982).

The Triabunna blockade highlighted the precarious financial situation of contractors and the need for organization. The Pulpwood Contractors Association was formed at that time, made up of both log

hauliers and prime contractors but, due to some antagonism between the contractors, it soon split into two separate organizations: the East Coast Contractors Association and the East Coast Log Hauliers Association. These groups were intended to protect and promote the interests of members who could not afford to spend time in negotiations with employers. However, many cartage contractors have since joined the Transport Workers Union and this body carries out most negotiations on their behalf. All prime contractors negotiate individually with the companies. To date, the Contractors Association has been concerned principally with lobbying against particular logging regulations; now, attempts are being made to form a statewide contractors association to act as a political pressure group and to improve the public image of loggers (personal communication M. McCulloch 1981).

The most successful prime contractors work in the bush or on the roads with their employees (personal communication N. Vance). Except when the demand for chips is low, as in 1974-75 and at present (1981-82), the hours of work for all contractors are very long. Hauliers average 10-14 hours per day, and it has been common for both logging and cartage contractors to work six days a week and to spend Sundays and some evenings on repairs and maintenance. Only major repairs to machinery are carried out in the population centres, Hobart, Launceston, and Burnie. Hauling is particularly stressful work, for contractors must carry a sufficient number of loads per day to meet their costs despite the fatigue associated with long hours and poor road conditions.

A characteristic feature of contractors - one which has been responsible for their being described as "independent" - is their "ownership" of logging and carting equipment. The cost of these heavy machines is very high, as shown in Table 3.9.

Most machinery is either leased or on hire purchase from one of a number of finance companies, foremost of which are ESANDA, Custom Credit, AGC and the Commonwealth Development Bank. It is frequently

TABLE 3.9

1981-82 prices for heavy machinery used by logging and cartage contractors[a]

Item	Price ($)
Truck (prime mover)	60 000 - 100 000
Jinker	20 000
Dozer	180 000 - 210 000
Skidder	90 000 - 150 000
Loader	170 000

[a] O'BRIEN, D. (ESANDA finance officer), 1982; personal communication.

said throughout the woodchip industry that finance companies have been its greatest beneficaries. Certainly, contractors are required to maintain repayments whether operating on a full or part quota. Although, in the early years of the industry, finance companies were quite liberal in their financial agreements (which, perhaps, allowed too many inexperienced hauliers on to the road and then into bankruptcy), they soon began to treat log truck owners more critically than any other type of transport operator. This was due to the lack of written contracts and greater insecurity experienced by sub-contractors who could not always be sure of sufficient work to keep their trucks on the road (personal communication D. O'Brien).

In August 1982, ESANDA, the major financier reported only repeat business with virtually no new people entering the industry during the preceding 18 months. As lowered quotas edge the smallest sub-contractors out of business, some are moving to mainland Australia to work on line haulage between major cities as the only means of retaining their trucks (personal communication D. O'Brien 1982). Prime contractors do not have this choice and find it a lot more difficult to leave the industry since bush machinery is harder to sell than a single log truck.

Most log trucks are generally leased (no deposit required) and changed every two years in the case of second hand vehicles or every four years in the case of new trucks. Most of the prime contractors and the larger sub-contractors use hire purchase arrangements which require a deposit. Leasing requires a minimum security of 20% and freehold farmers have often taken advantage of this form of finance, using their land as security. Thus, particularly in the early 1970s, many houses and properties were risked in the woodchip industry.

Examples of the income and costs involved in logging and carting are shown in the following tables; Table 3.10 gives the breakdown for an East Coast prime contractor delivering two loads of wood per day to the Triabunna mill from a distance of 120 km. Table 3.11 provides a similar breakdown for a sub-contractor carting chip logs to a rail-head and sawlogs to a sawmiller in North West Tasmania. In both cases (which are quite successful operations), it can be seen that repayments are the major recurring expense, accounting for over 25% of monthly income. However, as illustrated in Tables 3.12 and 3.13 as well as Table 3.10, fuel, tyres, repairs, and insurance and registration are all significant annual costs and may vary quite considerably between operations. Finance company instalments may range up to 40% of monthly costs while, in wet or difficult conditions, fuel and tyre costs may be as much as 100% higher than in average conditions (Table 3.12).

Potentially, prime contractors are in a more lucrative part of the industry than sub-contractors although an independent skidder owner-operator can make even greater profit. Some prime contractors have a very high annual turnover, $2.5 million in the case of Forest Resources' biggest contractor and $0.5 million each for some eight others engaged by that company. An estimate of the net profit of one of the industry's most successful operators was $55 000 in 1980-81 (personal communication P. Shepherd). However, as has been suggested,

TABLE 3.10

Example of the monthly income and expenses of an East Coast prime contractor for the woodchip industry, 1981-82[a]

TPFH contractor delivering two loads of chip logs per day from a distance of 120 km.

Income	$ per month
Gross income (May 1981)	22 000
Expenses	
ESANDA instalments	6 000
Registration and insurance	3 500
Tyres	1 000
Fuel	3 000
Repairs	500
Wages for bush workers (3)	1 800
Living	1 000
	16 800
Surplus	5 200

These figures represent a successful operation in which the contractor delivers the chip logs himself and also fills sawlog contracts in Launceston. The machinery necessary for such an operation would include a skidder, tandem trailer, crawler tractor, utility, and a log truck.

[a] O'BRIEN, D. (ESANDA finance officer), 1982; personal communication.

TABLE 3.11

Example of the monthly income and expenses of a North West Coast cartage contractor for the woodchip industry 1981-82[a]

APPM or Forest Resources cartage contractor hauling from forest to railhead in North West Tasmania.

Income	$ per month
from chip logs	6 000
from sawlogs	500
Expenses	
ESANDA instalments	2 000
Costs and living expenses	3 500
Surplus	1 000

These figures represent the leased operation of a new $60 000 log truck. Security might include a term deposit of perhaps $15 000, and a relative's guarantee.

TABLE 3.12

Estimate of the monthly expenses of an average cartage contractor receiving $6000 per month for delivering logs[a]

Fuel	10% (15% in heavy conditions)
Tyres	5% (10% " " ")
Repairs	5% (8% " " ")
Insurance and registration	5-8%
Finance company instalments	40%
Living costs, car loans	15%
Surplus (depending on conditions)	4-20% = $240 - $1200

[a] O'BRIEN, D. (ESANDA finance officer), 1982; personal communication.

TABLE 3.13

Average annual expenses of East Coast cartage contractors 1981-82[a]

	$ per year (approximate)
Range of Income	70 000 - 100 000
Average Expenses	
Registration and insurance	4 500
Lease payments	18 000
Tyres	12 000
Fuel and oil	24 000
Repairs and maintenance	14 000
Other expenses (for instance, running a utility)	2 000
Wages	11 000
Total expenses	85 500

These are average expenses and those associated with tyres, fuel, and repairs would vary widely according to length of haul and conditions and type of truck. As can be seen from the range of income for trucks, these factors, as well as the quota level, can greatly influence the viability as well as the profitability of cartage contractors.

[a] East Coast cartage contractor, 1982; personal communication.

many prime contractors and most sub-contractors, since early 1981, have been working on quotas which barely allow them to cover increasing expenses. In this situation, a number of hauliers have fallen behind by up to five to six months in their repayments (amounting to as much as $15 000), and many are just paying half instalments (personal communication East Coast log haulier 1982).

Combined with the information on income and expenses of contractors, this discussion has provided an indication of the vulnerability of this group, especially cartage contractors, to downturns in the woodchip industry. Many hauliers operate on a 'break-even' basis which becomes increasingly difficult as quotas are reduced to a minimum level. The cycle of working hard and long hours in order to keep up repayments continues from truck to truck. Although some prime contractors are quite financially successful, many are in a situation similar to that of the log hauliers. High capital costs necessitate stable quotas but these are not guaranteed and so are not always forthcoming.

3.2.2 Employees

(a) Company Employees

Company employees are located principally at the chip mill sites at Long Reach and Triabunna. These people are probably the most secure in the industry since their pay and conditions are covered by industrial agreements and their employment is least affected by fluctuations in the volume of wood processed. As well as mill workers, APPM also employs log truck drivers and these have been included in Table 3.14 which shows the numbers of employees engaged by each company. The occupations of these employees include forest managers, logging supervisors, office workers, operators, drivers of heavy machinery moving logs and chips in the mill yards, and truck drivers. The main unions

TABLE 3.14

Woodchip company employees 1981-82

Tasmanian Pulp and Forest Holdings[a]	
- Mill employees	115
Associated Pulp and Paper Manufacturers[b]	
- Mill employees	152
- Driver employees	60
Forest Resources[b]	
- Mill employees	138
TOTAL	465

[a] As at November 1981, personal communication from the company.

[b] As at August 1982, personal communication from the company.

representing mill workers are the Australian Timber Workers Union, the Electrical Trades Union, the Federated Engine Drivers and Firemens Association, and the Amalgamated Metal Workers and Shipwrights Union. Each mill operates three shifts per day with one a maintenance shift. In 1981, the average weekly wage of an unskilled mill worker ranged from $250 - $300. Wages paid to mill workers and staff of Forest Resources amounted to between $2.75 million and $3 million in 1981-82. Similar information is not available from other companies but, based on the employment numbers at each mill, a reasonable estimate of total mill wage payments for that year is $8.25 million - $9 million.

Most company employees live in the vicinity of the respective mill. On the East Coast, this means Triabunna or Orford, while Georgetown is a major centre of residence for Long Reach employees. A number of mill workers were recruited from heavy industrial occupations at Temco Pty Ltd and Comalco Ltd (basic metal refining companies situated at Bell

Bay near Long Reach).

During a downturn in demand for chips in 1974-75, the two Long Reach mills experienced periods in which only two shifts operated and a small number of people were sacked; also, short-term (two-four week) shut-downs occurred involving the laying off of most workers (Jones 1975). Temporary mill closures due to market oversupply have also occurred more recently; for instance, the Triabunna mill closed for one week in March 1982 (*Central Coast Courier* 17 March 1982).

APPM, Long Reach, also employs between 60 - 70 men to cart logs in company-controlled trucks. None of the other companies has this arrangement although, in the mid 1970s, TPFH financed 11 selected employees into the carting business. However, once established, these men operated independently (personal communication M. McCulloch).

(b) Contractors' Employees

Prime contractors employ bushworkers to fall trees, trim and debark trunks, and drag logs to bush landings, for loading on to trucks. If they operate one (or more) log trucks, then a driver(s) also may be employed. The approximate numbers of bushworkers employed in 1981-82 by contractors from each woodchip company are shown in Table 3.15.

Some bushworkers (for instance, most fallers), are employed on a contractual basis to handle a certain volume of wood per day. Neither the exact numbers nor the details of the particular employment arrangements of these workers are readily available; they have been included here as contractors' employees because of lack of information and also because the scale of investment is much less than that of prime contractors or cartage contractors (except perhaps for the rare independent operators of single pieces of logging machinery). Bushworkers may be paid piecework rates or according to the conditions of the Federal

TABLE 3.15

Woodchip industry bushworkers 1981-82[a]

Tasmanian Pulp and Forest Holdings Pty Ltd[b]	~ 120
Associated Pulp and Paper Mills Ltd[c]	~ 225
Forest Resources[d]	180
Forest Resources casual[d]	(30)
TOTAL (excluding casuals)	~ 525

[a] Excluding prime contractors but including workers involved in handling sawlogs as well as pulpwood.

[b] An estimate based on the average number of workers employed by prime contractors, November 1982.

[c] GRANT, D.W. (APPM), 1982; personal communication.

[d] SHEPHERD, P. (Forest Resources), 1982; personal communication.

Timber Industry Consolidated Award, which is negotiated by the main union covering bushworkers (the Australian Timber Workers Union). However, due to the scattered nature of bush work, the independence of bushmen, and a reluctance to employ union labour on the part of some contractors, perhaps only half to three-quarters of bushworkers are union members (personal communication P. Shepherd 1982). Average wages are similar to those of mill employees and, in 1981, ranged from $250 - $300 per week. In the same year a good faller had the potential to earn as much as $200 per day while a more typical figure was $100 per day (personal communication N. Vance 1981).

Bushworkers form the most transient group in the industry. They operate in often arduous and dangerous conditions notably in the wetter forests of the western-most part of the TPFH reserve areas and in the far North West where both APPM and Forest Resources obtain pulpwood. Historically, bushmen have come from poor rural backgrounds. Today, they still tend to be country people and, if cutting occurs far from

their homes, commonly live in caravans in the bush during the week. There is quite a high turnover in bush teams and contractors are said to often complain of a lack of good bushmen. This was particularly true of the East Coast woodchip industry in its early years, when contractors had to compete with northern and southern forest industries for labour (personal communication N. Vance 1981).

During periods of high woodchip demand, when bush teams are under strong pressure to fill raised quotas, the risk of serious accident increases. Each company covers its contractors and their employees for workers' compensation. Fallers, particularly, are prone to numbness and loss of feeling in their hands as a result of continuous chainsaw vibration.

Prime contractors and some cartage contractors may also employ log truck drivers. The numbers of employee drivers engaged by contractors for each company are shown in Table 3.16.

TABLE 3.16

Woodchip contractors' employee drivers 1981-82

Tasmanian Pulp and Forest Holdings Pty Ltd[a]	~ 35
Associated Pulp and Paper Mills Ltd[b]	-
Forest Resources[c]	40
Forest Resources (casuals)[c]	(4)
TOTAL (excluding casuals)	~ 75

[a] McCULLOCH, M. (East Coast prime contractor), 1981; personal communication.

[b] No information on contractors' drivers; it seems likely that most employee drivers are engaged directly by the company.

[c] SHEPHERD, P. (Forest Resources), 1982; personal communication.

Most of these drivers are members of the Transport Workers Union, but their position differs from that of owner-drivers as described in the

previous sub-section. Provided that their employers can remain viable, drivers receive regular wages but, in order to keep their jobs in the present economic climate, many have broken union awards in private agreements with contractors (personal communication T. Olthof, Transport Workers Union industrial officer 1982).

3.2.3 Associated Employment

Employment associated with the woodchip industry includes that in the Forestry Commission, involving management of woodchip concession areas, the supervision of logging, and regeneration of cut-over areas. Additionally, the employment of a considerable number of other people can be linked quite closely with the industry, for instance, those engaged in mechanical repair workshops, fuel agencies, and machinery and tyre sales. Edwards (1981) would define these jobs as the production-induced employment effect of woodchipping or as indirect employment. Further employment is also created by the spending of woodchip employees in all parts of the state, and this constitutes the consumption-induced employment effect of the industry.

A large percentage of Forestry Commission staff are connected with management of the woodchip operations of TPFH and APPM, but no one is involved solely in activities associated with the industry (personal communication Forestry Commission 1982). Since export woodchipping began, employment in the Commission has changed as shown in Table 3.17. Overall staff numbers have increased by 69, or 26%, and the industry has created the need for two new divisions within the Commission. Growth in public concern over forest management, particularly in relation to the woodchip industry, has prompted establishment of a public relations branch to deal with enquiries and to publicise the activities and policies of the Commission. The Private Forestry Division was set up in 1978 following an inquiry into private forestry in Tasmania

TABLE 3.17

Changes in Forestry Commission employment 1970-1981[a]

Staff Division or Branch	1970	1981
Administration	13	18
Accounts	23	26
Public Relations	-	3
Division of Forest Management	73	111
Division of Operations	6	10
Division of Engineering	21	17
Division of Marketing	5	7
Field Administration	120	128
Division of Private Forestry	-	10
Total Staff	261	330
Award Employees	450	405
Total Commission Employment	711	735

[a] QUICK, J.R., 1982; personal communication.

(Everett 1977), which reported only very low levels of regeneration on private land after clearing for woodchips. Most people who have joined the Commission since 1970 have become involved in forest management (in activities such as volume assessment, yield calculations, royalty estimates and so on, mainly in connection with pulpwood production). Except for those in field administration, most staff are based in Hobart. Despite an increase in forest works, including road and bridge building and plantation and regeneration work, mechanization has reduced the number of award employees between 1970 and 1981. These people are mainly country people who live and work in the north west, north, and eastern parts of the State.

Table 3.18 shows the total staff and employees permanently allocated to districts wholly or partly within the woodchip concession areas of APPM and TPFH. Although not included in this table, other employees are also involved in management and roading for the far north west woodchip operations of APPM and Forest Resources.

TABLE 3.18

Forestry employment in districts wholly or partly within woodchip concession areas[a]

District	Staff	Award Employees
Triabunna	11	12
Fingal	14	50
Scottsdale	13	48
Launceston	11	14
Deloraine	9	11
Devonport	14	21

[a] QUICK, J.R., 1982; personal communication.

Other employment associated with the industry will be touched on here, though only in quantitative terms. Jobs have been created in urban as well as rural areas. As discussed in sub-section 3.2.1, most contractors carry out their own repairs and maintenance, but major work is done in the garages of cities and large towns. Similarly, most spare parts have to be obtained from the cities of mainland Australia. Several heavy machinery firms with yards in Hobart and Launceston receive a considerable proportion of business from woodchip contractors. Three of the four main companies, ISAS (Tas) Pty Ltd, William Adams Tractors, and Banbury Engineering derive about 50% of their business from the industry, while it accounts for about 30% of the sales by Maloneys Pty Ltd (personal communication J. Schofield, sales manager ISAS Pty Ltd, 1982).

Tyre, fuel, and chainsaw agents are more widespread throughout the concession areas and provide a number of small business opportunities. Other local businesses have become established to service the industry; one such business is the construction of logging jinkers. All these types of small concerns are almost completely dependent on the woodchip industry and, although providing a useful service to other primary industry (such as farming and fishing), would be unlikely to remain viable solely on this custom. In a similar manner, the daily needs of woodchip employees and their families, while not necessarily increasing employment, have boosted the incomes of rural retailers whose services were previously under-utilized.

Edwards' (1981) employment multpliers for 1978 are used to provide an indication of the number of people in Tasmania whose employment is closely associated with the industry (Type I) and those whose employment is induced through industry employee spending (Type II). For this estimate, mill employment (405) is taken as direct employment and a Type IB multiplier of 5.546 and Type II multiplier of 9.253 are used. These figures suggest that about 1840 people are employed indirectly by the industry. Since this figure includes the number in logging and carting which has been estimated at 916 (Tables 3.8, 3.14, 3.15, and 3.16) this means that about 924 people are employed in Tasmania in other industries (such as those mentioned here). In total, the industry supports approximately 3750 jobs. Excluding those directly and indirectly employed (2245) suggests that employment in retail, commercial, and entertainment sectors due to the spending of these workers is of the order of 1500. Most of this employment is spread throughout the northern, central, and eastern parts of the State and contributes to the income of many rural towns and communities.

3.2.4 Conclusion

The total numbers of woodchip employees (in forest and mill, and on the roads) for each company are shown in Table 3.19. Altogether, in 1981-82, approximately 1320 people were involved in the industry. At least an additional 50 forest and transport workers are employed in the industry on a casual basis. Not all of these people are solely involved in the woodchip industry since integrated sawlog/pulpwood cutting involves woodchip contractors also handling and delivering sawlogs. However, it is difficult to separate out the sawlog induced employment and equally difficult to determine the degree of its dependence on pulpwood cutting.

TABLE 3.19

Total woodchip employment 1981-82[a]
(including mill and bushworkers, contractors and drivers)

Tasmanian Pulp and Forest Holdings Pty Ltd	~ 360
Associated Pulp and Paper Mills Ltd	~ 500
Forest Resources (excluding casuals)	~ 460
Total	~ 1320

[a] Totals derived from data presented in Tables 3.12, 3.13, 3.14, and 3.15.

From the preceding description of the organization and nature of woodchip employment, several features bear further discussion. Three main employment groups were recognized: the self-employed contractors, the company and contractor employees, and those providing industry services.

The first group acts as a buffer for the woodchip companies, expanding or contracting in size according to market conditions. Although, in good times, this group stands to gain considerably from the industry, far from being independent, it is perhaps the most

dependent group risking a high level of personal investment without guaranteed agreements. It would seem that, for a variety of reasons (including ability, experience, and prevailing conditions), a considerable number of contractors (mainly hauliers) have been unable to manage in the industry. This has been masked by a reserve of people waiting to join the industry but, nonetheless, indicates that its structure and growth have not optimized benefits for this employment group. Also, the fact that part-time farmers are often first to be laid off when chip demand is low indicates that benefits to the pre-existing rural population may be limited in some respects.

The employee group is comprised of two main sections with different characteristics; mill workers and other company employees are unionized and have regular hours and conditions, while bushworkers employed or hired by contractors are less unionized and work under more irregular conditions, their jobs being dependent on the continued viability of contractors. Company employees have probably benefited most in terms of stability and security with the least commitment to the industry other than, perhaps, the relocation of family and home closer to the chip mill. However, working in scattered isolation, contractors' employees, both bushmen and drivers, are more vulnerable to a decline in living standards during industry downturns.

The third employment group, involved in industry services, is less affected by industry changes, although these may still be quite significant, especially for small businesses which have established in or near mill towns expressly for the purpose of providing specific industry services.

In 1980-81, a maximum of approximately 1320 people were involved in forestry and logging, hauling, and processing in the woodchip industry. Counting those in associated employment gives a total number of direct and indirect jobs of some 2245. An estimate of the total employment

effect of the industry, including that of employee spending is about 3750. This employment is popularly perceived, by politicians and the broader community, as one of the main benefits of export woodchipping and as a justification for lack of obvious public profit in the royalties received for the acquisition of wood from Crown land, and also for the public costs incurred by the industry in forest regeneration and road works. The final section of this chapter will examine some of these public costs incurred by the woodchip industry.

3.3 PUBLIC EXPENDITURE ON THE EXPORT WOODCHIP INDUSTRY

The peripheral nature of the Tasmanian economy with a narrow manufacturing and tertiary base has led to an emphasis being placed on production of export-orientated goods. In keeping with this strategy, the attractiveness of woodchipping lies in the export of an extensive natural resource that had hitherto been under-utilized from a production point of view. It has already been pointed out that additional employment is the main social benefit flowing to the State from this utilization of Crown forests for woodchips by private companies. In crude terms the harvesting of 2.4 million tonnes of woodchips, 1.5 million tonnes of which is committed from public land, the rest from private property, provides approximately 3750 jobs in total dispersed throughout rural Tasmania. Employment benefits, however, are only one aspect of the industry; in order to process pulpwood from areas distant to the mills, the industry requires a major transport network. At the time woodchipping began in Tasmania, the necessary transport infrastructure requirements were either non-existent or inadequate. Consequently State involvement in the woodchip industry has extended beyond long-term guaranteed wood supplies to include road construction and maintenance, the building of a railway network and the provision of port facilities. In addition to this, the bulk of Forestry Commission

activity is now focussed on management of woodchip concession areas.

The possibility of massive public expenditure is providing and maintaining an adequate infrastructure for the woodchip industry has prompted public criticism and has led to a number of government reports dealing with the subject. One such study, conducted by officers from various Commonwealth Government departments handed down a final report on "The Economic and Environmental Aspects of the Export Hardwood Woodchip Industry" in April, 1975 (Cromer *et al.* 1975). Three criteria were used to evaluate the industry; two of these related to the need for the State concerned to profit from the provision of forestry services and transport infrastructure. With regard to the former, the report concluded that "...the royalties received by the forest services for sawlogs and pulpwood in three of the concession areas are sufficient to cover the costs of harvesting, regeneration and subsequent management."

In respect of infrastructure requirements, the report concluded that "The export woodchip industry has noticeable impacts on the development and rate of utilization of infrastructures within the regions in which woodchip projects are located."

Despite these findings, public disquiet over increased woodchip-related government expenditure, has continued. With a few exceptions, there is little publicly available literature quantifying the full extent of government involvement. Recent reports by the Forestry Commission and the Transport Commission of Tasmania, although reinforcing the common perception of extensive public subsidization of the woodchip industry, were both limited in scope and not able to discuss certain outstanding features that warrant further attention. This section draws together such reports in conjunction with information supplied by the Australian Bureau of Statistics, other government publications and various research projects, in order to indicate something

of the full extent of public expenditure on infrastructure for the export woodchip industry.

Assuming returns on public expenditure should at least cover the costs of providing services and facilities, particularly by resource-exploitative industries, leads to a questioning of the findings of the Cromer Report (1975) in a similar vein to the cost-benefit analysis of the Manjimup woodchip project in Western Australia conducted by Walter (1976) and commissioned by the South-West Forests Defence Foundation. The section covers four basic areas of public expenditure involving roads, railways, port facilities, and forest management.

3.3.1 Public Expenditure on Roads

Prior to export woodchipping getting fully underway, it was clearly recognized by both local and State authorities, that the industry would incur additional costs in road expenditure. In 1970 the Public Works Department estimated the costs of upgrading a road network of 240 miles to be used by the Long Reach woodchip mills to be $16 million† (Tasmania, Parliamentary Standing Committee of Public Accounts 1973). This estimate was used as part of the overall argument for construction of the Bell Bay railway link which, at that time, was considered a cheaper alternative despite the fact that the road network was eventually used by the woodchip industry regardless of the railway link.

At the local government level, the Municipal Association, in particular, a group of northern municipalities, was lobbying State parliament as early as 1971 to alter the Local Government Act 1962 in order to remove restrictions on road tolls levied by local councils. The alterations became law in 1973; in the interim period the Association had commissioned a report on the effects of woodchip traffic on the municipal road system (Bennett, Hudson, Nieuwhof 1971). The report concluded that few, if any, municipal roads were adequate to cater for

† At current 1982 values this is equivalent to $50 million.

woodchip traffic.

Despite the imposition of road tolls on woodchip traffic by State and local authorities in the early 1970s, concern over levels of public expenditure on roads has continued. A comprehensive study of the log haulage industry in Tasmania by the Transport Policy Unit (1981), attempted to quantify the extent to which road tolls for log trucks fall below the associated increase in costs. At the local Government level, various councils have continued to voice concern over road damage, more than a decade after the establishment of the woodchip industry (*Central Coast Courier* 7 October 1981, *Advocate* 11 January 1980). The following discussion provides a context in which this continuing statewide concern over roading costs can be understood.

The responsibility for most road construction and maintenance in Tasmania is shared by the State government, local government, and various government enterprises, including the Forestry Commission. The State government has responsibility for classified roads consisting mostly of highways and main roads. Local government authorities deal with municipal roads built and maintained by the respective councils. The bulk of funds for classified roads are provided under the Commonwealth Road Grants Act 1980 with the State contributing a significant amount through various taxes and vehicle fees (Australian Bureau of Statistics 1981c). Most of the funds are provided through the State Highways Trust Fund administered by the Department of Main Roads. Local government authorities derive their funds primarily from rates for ordinary services, with an increasing percentage coming from Commonwealth funds. It should be noted that all funds, whether Commonwealth grant or State government taxes and fees, do not require repayment of either capital or interest.

Tables 3.19 and 3.20 indicate financial trends in road expenditure by both State and local authorities in Tasmania. It is assumed that

TABLE 3.19

Revenue and expenditure for the State Highways Trust Fund: 1969-1980 (constant 1980 $M)[a]

Year	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Revenue														
Commonwealth Aid	21.54	22.44	23.04	23.84	25.68	25.43	26.85	27.34	31.23	29.95	27.14	25.82	25.53	24.94
State Revenue	11.38	12.22	12.44	12.65	12.63	13.40	13.06	12.43	11.19	12.74	14.45	15.92	16.96	16.05
Total[b]	33.71	35.83	35.88	38.02	39.86	39.72	41.04	41.45	43.76	44.09	42.98	44.45	44.52	42.46
Woodchip Companies Combined Contribution							.256	.484	.425	.231	.274	.218	.197	.226

[a] TASMANIA, STATE PARLIAMENT, 1967-1980; *Auditor-General's Report 1967-1980;* Government Printer, Hobart.

[b] Includes other miscellaneous items of expenditure.

TABLE 3.20

Source of funds for local government authority expenditure on roads, streets, and bridges: 1967-1979 (constant 1980 $M)[a]

Revenue Source/ Financial Year	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Ordinary Revenue and Business Undertakings	12.72	14.31	13.91	12.73	13.54	15.85	17.87	15.72	20.51	20.86	19.98	18.50	19.24
Commonwealth Grants	3.97	4.60	4.20	4.19	4.85	4.83	4.56	4.51	5.25	5.43	6.38	6.76	6.83
Loan Accounts	5.68	5.51	5.50	5.37	4.80	4.57	4.82	4.82	4.62	5.15	5.87	8.59	8.34

[a] AUSTRALIAN BUREAU OF STATISTICS, 1967-1981; *The Yearbook 1967-1981;* Australian Bureau of Statistics, Hobart Office, Hobart.

the time-span chosen represents an adequate period to observe possible changes brought about by the woodchip industry. Total funds provided through the State Highways Trust Fund have increased, in real terms, by 22% from 1967-1981. Although Commonwealth grants comprise the bulk of these funds, an increasing proportion is coming from State revenue. For local government authorities, expenditure on roads from rates has increased by 51%, from Commonwealth grants by 72%, and from loan funds by 47%. It is evident that, throughout the 1970s, public expenditure on road construction, reconstruction and maintenance increased quite significantly; the difficulty is determining how much of this increase, if any at all, can be attributed to the woodchip industry. A useful starting point is to provide a 'before-and-after' picture of financial trends closely connected with export woodchipping.

Taking the five year period prior to the beginning of woodchipping in Tasmania (1967-1971), the average annual State Highway Trust Fund expenditure on roads under its jurisdiction amounted to approximately $36.7 million. Assuming a time-lag between initial damage being caused by log trucks and the corresponding increases in public expenditure, indicates our attention should be directed to the five year period 1974-1978 when the average annual expenditure was approximately $43.4 million. Thus, in the period under discussion, average annual expenditure from the State Highways Trust Fund measured in real terms, increased by $6.7 million. The same 'before-and-after' picture in expenditure by local government authorities shows a combined average annual increase of $6.1 million within ordinary revenue and loan accounts (see Table 3.20; Commonwealth grants to local government areas are provided through the State Highways Trust Fund and are thus credited under that fund).

Combining both State and local authority expenditure on roads shows about $12.8 million was added to the annual road bill following

establishment of the export woodchip industry in Tasmania. The bulk of the increase was absorbed by the State in the form of increased motor tax, licence fees and local government rates (Tables 3.19 and 3.20). The question still remains, however, as to how much of the overall increase can be attributed to export woodchipping. In the past, the State has experienced similar fluctuations in road expenditure before the advent of woodchipping. Nonetheless, what occurred in Tasmania throughout the 1970s is atypical of road expenditure trends in other Australian states and suggests exceptional factors influencing the Tasmanian situation. During the 1970s total State and local authority expenditure on road systems throughout Australia rose by $182 million (1980 dollars) or 12% (Australian Bureau of Statistics 1981d). During the same period in Tasmania, the corresponding increase was 22%. However, this rise was not exceptional; other states, in particular New South Wales, experienced a similar increase. Of much greater significance is the difference in road expenditure for the period 1974-1978, the same period previously used to examine the possible effects of the log haulage industry on road expenditure. In this period, total expenditure on road systems throughout Australia increased in real terms by 8% (Australian Bureau of Statistics 1981d). For Tasmania, the increase was 40.8%, considerably higher than other states where changes ranged from a small decrease in Western Australia to a 14% increase in South Australia (Australian Bureau of Statistics 1981d).

Given that increases in road expenditure during the mid-seventies were quite marked in Tasmania relative to other Australia states, factors other than woodchipping may have been influential. The early to mid 1970s witnessed sharp increases in oil prices in conjunction with a wages explosion. Both these factors make a significant contribution to road construction and maintenance costs. In order to accommodate these trends, the Department of Main Roads has developed a roading

index that measures the rising cost of major components in its operations. This can be compared to the Consumer Price Index to obtain a measure of the rise in roading costs relative to the inflation rate. The results are summarized in Table 3.21.

TABLE 3.21

Annual percentage increase in expectation by the Department of Main Roads (DMR) compared with the CPI Index 1971-81[a]

Year	DMR % Increase	CPI % Increase	% Difference
1971	10.8	4.6	+6.2
1972	11.6	6.4	+5.2
1973	9.7	7.2	+2.5
1974	21.4	14.7	+6.7
1975	22.7	16.4	+6.3
1976	17.2	14.9	+2.3
1977	12.8	13.0	-0.2
1978	7.5	8.3	-0.8
1979	6.1	8.8	-2.7
1980	12.3	10.1	+2.2
1981	10.8	8.9	+1.9

[a] DEPARTMENT OF MAIN ROADS, 1982; *Report for the Year 1980-81;* Government Printer, Hobart.

During the first half of the 1970s, costs rose at a significantly higher rate than inflation. Applying this trend to statewide expenditure on roads[†], we find that approximately 10% of the increase in road expenditure between 1967-71 and 1974-78 was attributable to rising costs. It would seem that relative cost increases have not been a major factor in explaining the marked increase in road expenditure prior to, and following, the full commencement of the export woodchip industry.

[†] See Tables 3.19 and 3.20. This approach assumes price increases to be similar for road construction and maintenance by authorities other than the Department of Main Roads.

There is ample evidence to support the contention that the log haulage industry is a major contributor to rising costs in road construction and maintenance throughout the 1970s. At the onset of export woodchipping much of Tasmania's road network was under-designed to cater for a major log hauling industry (Tasmania, Transport Policy Unit 1981). The roads were often quite narrow and poorly surfaced particularly in the eastern half of the State, the main location for pulpwood harvesting. Within a short period, the roads were subjected to the wear and tear of an additional 250-270 log trucks often travelling at relatively high speeds† increasing pavement damage over and above the normal wear caused by such heavy vehicles. This contention is strongly supported by a commonly accepted rule applied in estimating roading costs.

"The 'fourth-power' rule dictates that the structural damage done to a road by the passage of a vehicle increases roughly in proportion to the fourth power of the gross axle load of the vehicle" (Douglas 1977).

The 'fourth-power' rule implies that at average loadings a medium sized truck will do several hundred times more damage to the road than a car (Taplin 1981). The damage caused by heavy trucks is even greater; they cause thousands of times more damage according to one study (Douglas 1977). As a result, heavy vehicles are almost entirely responsible for road damage and, consequently, for most of the reconstruction, resealing and maintenance costs (Taplin 1981). Furthermore, in addition to the effects heavy vehicles have on roads, there seems to be a relationship between the load carried and the damage caused. From studies conducted on New Zealand roads, it was found that trucks carting logs caused greater structural damage to roads than any

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† The high speeds are connected with the need for each log haulier to fill quotas in order to meet repayments on the truck. In the early days of woodchipping quotas were not set and the more logs delivered the greater the profit.

other type of load examined (Douglas 1977). Depending on the commodity, the damage caused by log trucks could be two to three times greater than that caused by trucks carrying other commodities.

The general effects of heavy vehicles on roads have long been appreciated. Before the commencement of the export woodchip industry in Tasmania, State transport authorities were well aware of the potential road damage connected with the log hauling industry (Tasmania, Parliamentary Standing Committee of Public Accounts 1973). In recognition of this, both State and local authorities imposed road tolls on pulpwood for export. All three export woodchip companies contribute to the State Highways Trust Fund; the combined contribution for 1980-81 was $272 000 (Table 3.19). In addition, each company pays separate road tolls to local authorities. These tolls are negotiated with each council and are not usually disclosed to the public. Companies also enter agreements with a number of councils to maintain or construct roads used by the company in the municipality. Other financial arrangements made with local councils include lump-sum or 'ex-gratia' payments. The Transport Polity Unit (1981) has estimated the financial contribution by woodchip companies to local government areas at about $510 000 per annum.

Although road tolls and other financial arrangements represent a significant source of revenue for the State, motor and fuel tax imposed on individual truck owners are the major contributors. These two sources of revenue formed part of a detailed economic analysis on the additional roading costs imposed by heavy vehicles jointly funded by the Government of Tasmania and Commonwealth Government of Australia under the Transport Planning and Research Program (Taplin 1981). Examination of various types of heavy vehicles indicated that, for an articulated, five-axle log truck, the total motor and fuel tax (measured in cents per kilometre) paid to the State was less than a quarter of the

amount required if the State were to recoup the roading costs incurred by this type of heavy vehicle (Taplin 1981). In order to reduce this hidden subsidy, it was recommended that a State tax be imposed falling most heavily on diesel fuel rather than petrol, but "substantial increases in charges on very heavy vehicles are still required" (Taplin 1981).

By limiting examination of revenue from the log haulage industry to motor and fuel tax, the Taplin study excluded other important sources of revenue such as registration fees, licence fees, out-of-area permits,† 'ex-gratia' payments and road tolls. These factors were taken into account by a similar study conducted by the Tasmanian Transport Policy Unit (1981). This study estimated the total revenue received by the State from five-axle timber trucks to be 7.57 cents per kilometre; statewide, this represents approximately $2 million annually (this figure is a mid-range estimate and is based on similar (and often identical) information used in the Taplin study). The figure 7.57 cents per kilometre is 11.85 cents per kilometre below the full recovery costs required from the log haulage industry* (Taplin 1981). Assuming that approximately two-thirds of those involved in the log hauling industry are primarily connected with woodchip operations, then public subsidy to the industry for use of the road system amounts to a minimum of $2-3 million per annum. Even this conclusion is likely to represent

† Out-of-area permits are fees paid to the Transport Commission for haulage distances over 100 km. The original intention of the levy was to make rail transport more favourable over long distances. Payments are largely used for administrative purposes and do not go back into the road system. Intentions are to phase the system out over the next few years (personal communication, N. Applin Transport Commission 1982). In 1980-81, a total of $83 333 was paid for logs carried under permit (Tasmania, Transport Commission 1982).

* These figures assume an average yearly travelling distance of 60 000 km for each truck. The recovery costs required not only include maintenance for road damage but also include notional interest charged on the capital value of the road system.

an underestimate of the true situation. In calculating the total recovery cost required for timber trucks, the policy of the Taplin study "has been to select an estimate at or near that extremity of the likely range of values which will *minimise* the costs attributable to heavy vehicles" (Taplin 1981).

While $2-3 million is clearly an understatement of the likely costs associated with the woodchip industry, the previous estimate of $11-12 million would seem to be on the high side of the range of values within which the real costs lie. What we can say is that, in the early 1970s, Tasmania's inadequate road system was subjected to an extensive additional burden placed on it by an industry known to cause serious structural damage to many roads. Subsequent financial trends in road expenditure are demonstrably peculiar to Tasmania in their magnitude, particularly when considering the proportional increase in expenditure and could not be explained in terms of cost and wage increases. By the early 1980s both public and government concern over subsidization was still being voiced.

3.3.2 Public Expenditure on Port and Railway Facilities

The provision of an adequate transport network for the woodchip industry has also led to public involvement in construction and upgrading of rail services and port facilities. The former was the focus of considerable debate and criticism following construction of the Bell Bay railway link in the early 1970s. On the other hand, government expenditure on port facilities has received little attention from the public. This subject will be discussed briefly followed by a re-examination of the Bell Bay railway controversy.

By its very nature, export woodchipping requires adequate and safe port facilities. Marine Boards, Port Authorities and Harbour Trusts (hereafter referred to as port authorities) provide the services

and infrastructure necessary for the operation of Tasmania's ports. The port authorities operate as semi-autonomous bodies, although approval for large capital borrowings and regular auditing is required by the State (personal communication, I. Fleming Port of Launceston Authority 1982). Revenue is largely in the form of port charges and wharfage dues. Port charges basically apply to the use of services and facilities, while wharfage rates are levies on goods, either imported or for export. Running and capital costs are the main forms of expenditure. Capital funding, up to a prescribed limit, is done by the authority itself, usually from private institutions at a semi-governmental borrowing rate set by the State Government. Approaches to the Loan Council are required for borrowings above a certain limit; in the case of the Port of Launceston Authority, the maximum is $1.5 million (personal communication, I. Fleming Port of Launceston Authority 1982). There is an important distinction between capital expenditure on rail and port facilities and that of roading. Theoretically, rail and port authorities are required to repay both interest and principal on capital borrowings. Since port authorities operate on a profitable basis (with a few minor exceptions), any capital expenditure on infrastructure should eventually be recouped through normal revenue charges.

The location of each woodchip operation away from urban areas has meant that the necessary infrastructure had to be provided solely for the industry. In the cases of APPM and TPFH, the task fell to the appropriate port authorities. Forest Resources provided the finance for construction of its loading wharf at Long Reach by the Port of Launceston Authority (Cromer *et al.* 1975). Wharf facilities, however, are only one part of port authority operations; the woodchip industry has also benefited from channel dredging to accommodate the large woodchip carriers. Table 3.22 summarizes major items of expenditure by port authorities connected with the export woodchip industry. Just over

TABLE 3.22

Estimated and final costs of port facilities for the woodchip industry[a]

Facility	Estimated Cost $	Year	Final Cost $	Year
Spring Bay Wharf	500 000	1968-69	912 000	1970-71
Common User Berth (Long Reach)	900 000	1971-72	2 200 000	1972-73
Lower Reach Channel Development Scheme	3 000 000	1967-68	4 000 000	1968-69

[a] TASMANIA, STATE PARLIAMENT, 1969-1975; *Auditor-General's Report 1968-1975;* Government Printer, Hobart.

$7 million were spent by the Hobart Marine Board and the Port of Launceston Authority in providing wharf facilities and channel alterations. The Lower Reach Channel Development Scheme, although instigated to service the Bell Bay Thermal Power Station as well as the export woodchip industry, has mainly benefited the latter as the power station rarely operates at full capacity and receives only one or two tankers each year (personal communication, J. Todd Centre for Environmental Studies 1982).

Owing to the profitability of port authority operations, the extent of public subsidization is difficult to determine. Certainly, from the point of view of APPM and TPFH, public expenditure at relatively low interest rates has provided an indirect financial gain. Hanke (1980) has estimated the private sector risk premium on government guaranteed loans to be approximately +3%. For a $3.1 million private loan (equal to the combined capital cost of the Spring Bay wharf and Common User Berth at Long Reach), over a 15 year period with an average annual inflation rate of 10%, this represents an indirect public subsidy of approximately $1 million.

With the initial costs and capital risk involved in providing port facilities being borne by port authorities, woodchip companies have

been able to avoid paying high levels of interest on capital borrowings. While it appears that public subsidization in this area has not been of great significance, government spending on port facilities has, nonetheless, proven quite beneficial to the woodchip companies involved, particularly APPM. The situation with regard to railway services presents a very different picture.

Most commentary on railways in Tasmania and their connection with the woodchip industry inevitably focuses on the Bell Bay railway link. The political and economic circumstances surrounding its construction have been well documented by the Parliamentary Standing Committee of Public Accounts (1973) and by Davis (1975). The following brief discussion draws heavily from these publications.

The idea of providing a rail link between the industrial regions of Bell Bay and the city of Launceston was first mooted in 1950 (Davis 1975). Although examined, the possibility of constructing the 50 kilometre railway was shelved by the mid-1950s. It was decided that, before any decision was taken, it would be necessary to conduct a detailed economic analysis and survey the proposed route (Davis 1975).

In the late 1960s, the possibility of two woodchip plants being located at Long Reach just south of Bell Bay revived interest in the rail link. According to Davis (1975) the project was enthusiastically supported by a new Liberal Government "anxious to project an image of innovative development strategies and new economic opportunities". Informal approaches had been made to the Government by APPM which was also undoubtedly anxious to have an adequate transport network. The Tasmanian Government agreed in principle to construct the rail link with time constraints being imposed by the contractual obligation of APPM to ship its first load of woodchips to Japan by June 1972. What followed this decision has been well documented by Davis (1975). Basically, three separate feasibility studies were conducted each based on the construction

of a railway route that still had not been thoroughly surveyed. Attempts to conduct a more thorough appraisal were effectively short-circuited by the State Government anxious to submit proposals to the Commonwealth Government for financial assistance in order to complete the project. Consequently, as the project got under way, the initial estimated total cost of $3 million (by this time the State had already committed itself to constructing the line) proved grossly inaccurate (Tasmania, Parliamentary Standing Committee of Public Accounts 1973). The Auditor-General's Report (1972) estimated the final cost to be $30.86 million. The escalation was largely due to construction difficulties associated with the, as yet, unsurveyed terrain. A more realistic estimate by Davis (1975) put the final cost at between $35-40 million, including upgrading of the Fingal to Launceston line, part of the woodchip rail transport network. The poor handling of the situation led the Auditor-General (1972) to comment that "One cannot but reflect on the prudence of committing relatively vast sums of public money to a project where the timetable is apparently dictated by non-government requirements and where detailed investigation of civil engineering requirements and estimated costs had not been completed."

The rail link to Bell Bay was not fully operational until May 1974 by which time logs were being transported to the Long Reach mills by road (Davis 1975). Throughout the early period, APPM had been negotiating for an additional 300 000 tonne contract with Japanese paper-makers. The company regarded the contract as essential to the profitability of its woodchip project and on various occasions threatened to withdraw from the venture if the Government did not guarantee certain freight rates contained in correspondence between the company and the Transport Commission (Tasmania, Parliamentary Standing Committee of Public Accounts 1973). Following practical negotiations between a Committee of Senior State Officers and APPM representatives, a draft

transport agreement was signed by both parties in December 1971. The final freight rates ranged from 1.5 to 2.5 cents per net ton mile; although the rates were clearly inadequate, the Government regarded itself as 'morally bound' to uphold the freight rates originally discussed by the company and members of the Transport Commission (Tasmania, Parliamentary Standing Committee of Public Works 1973). It is important to note that these rates for various routes were set according to the estimated costs of the project outlined in the original State Government submission to the Commonwealth; that is, when the projected capital outlay was estimated to be $14.7 million (Tasmania, Parliamentary Standing Committee of Public Accounts 1973). The rates were set to operate for periods of up to 15 years with escalation clauses to cover increasing costs of labour and fuel, but *not* increased capital costs (Tasmania, Parliamentary Standing Committee of Public Accounts (1973). Furthermore, the escalation clauses were not to operate for several years. Similar agreements were entered into with Forest Resources (then known as Northern Woodchips Pty Ltd).

It is difficult to see how the Bell Bay railway project could be regarded as economically viable. Most of the $35-40 million capital outlay plus interest, is only recoverable through freight rates that were set well below the level of public investment and fixed for a long period of time. The predicament was acknowledged by Transport Commission officials as early as 1973 "Northern Woodchip's rates would cover running costs and go part of the way to covering interest. Generally, they thought APPM rates would have to be approximately 50% higher to cover all expenses, including interest, in 1973-74" (Tasmania, Parliamentary Standing Committee of Public Accounts 1973).

More specifically,the rates represent a loss arising from the Bell Bay railway of $465 000 in 1972-73 and $436 000 in 1973-74 (Tasmania, Parliamentary Standing Committee of Public Accounts 1973). The financial

situation is less clear from these years onwards. Table 3.23 outlines various woodchip-related railway statistics up to 1977 (there are no publicly available figures from 1976-77 onwards due to the takeover of the Tasmanian Department of Railways by Australian National Railways. Railway statistics for Tasmania are now grouped with those of other operations under the ownership and control of ANR). It can be seen that, although average revenue per tonne for woodchip logs has increased from 2.23 cents in 1972-73 to 3.14 cents in 1976-77, these levels have consistently remained 55-65% below the average return on all goods transported by the railways.

This lower return per tonne for woodchip logs than other commodities is reflected in the difference between the woodchip component of total goods tonnage and the corresponding percentage of goods revenue (Table 3.23). In other words, between 1973-77, the woodchip industry was not paying as much as other industries for each tonne carried by the railways. The suggestion here is that there would have to be considerable economies of scale and increased freight rates before the Bell Bay project could even cover its costs let alone make a profit. In regard to freight rates there is no indication from Table 3.23 that this has occurred.

The likelihood of the Bell Bay railway ever proving a profitable venture is remote, a conclusion which is reinforced by trends in operating losses incurred by the Tasmanian Department of Railways. In the period 1970-77, the operating loss of the Department grew from $9.18 million to $20.65 million, a 125% increase in real terms (Table 3.24). The loss would have been far greater had the Department been required to pay interest charges on capital borrowings from 1975-76 onwards, as in previous years. These losses have occurred as the woodchip component of total goods revenue increased to 18%. An important feature of Table 3.24 is the sharp increase in operating loss at precisely the same

TABLE 3.23

Tasmanian Railways - woodchip component of goods hauled and revenue obtained: 1973-1977[a]

Year	Tonnes	Percentage of total tonnage	Amount $	Amount 1981 $	Percentage of total goods revenue	Percentage of total revenue	Average Revenue per ¢/tonne	Average Revenue All goods ¢/tonne
1972-73	123 873	8.04	271 785	654 270	4.57	3.97	2.23	3.93
1973-74	397 718	21.51	890 052	1 743 700	12.98	11.60	2.27	3.77
1974-75	459 507	26.60	1 176 780	2 149 301	15.92	14.24	2.56	4.28
1975-76	362 116	22.57	1 089 647	1 761 350	15.06	13.54	3.01	4.50
1976-77	471 345	28.71	1 480 147	1 932 184	18.44	16.86	3.14	4.84

[a] TASMANIA, TRANSPORT COMMISSION, 1973-1977; *Annual Reports 1973-1977;* Government Printer, Hobart.

TABLE 3.24

Operating loss - Tasmanian Department of Railways: 1967-1977[a]

Year	Amount $M	Amount 1981 $M
1966-67	2 717 278	8 491 663
1967-68	3 196 303	9 669 404
1968-69	3 180 000	9 375 820
1969-70	3 214 140	9 177 136
1970-71	5 367 979	14 638 281
1971-72	5 781 363	14 750 338
1972-73	7 119 931	17 139 873
1973-74	10 588 524	22 569 447
1974-75	14 954 299	27 312 915
1975-76[b]	13 925 802	22 510 246
1976-77	14 539 265	20 649 758

[a] TASMANIA, TRANSPORT COMMISSION, 1967-1977; *Annual Reports 1967-1979;* Government Printer, Hobart.

[b] Decline largely due to the non-requirement to pay interest on capital borrowings.

time construction began on the Bell Bay project.

Davis (1975) is correct in suggesting that the Bell Bay project is "not necessarily a long-term liability to the State". Nonetheless, when considering the economic history of railways in Australia in general, as well as the circumstances surrounding the Bell Bay railway project and subsequent financial trends, it appears extremely unlikely that the public will ever be able to realize on its 'investment'.

3.3.3 Public Expenditure on Forest Management

Public involvement in the woodchip industry has extended beyond the provision of a transport network to the management of Crown forests.

The umbrella term 'management' includes such things as resource evaluation, management plans for State forests, and forest protection. According to the Forestry Commission of Tasmania, which carries out these functions, the major aim of this process is to "achieve sustained production of sawlog and pulpwood as the base for stable forest-based industry" (Tasmania, State Government 1979). Whether this goal is feasible in the very long-term remains to be seen; in the short-term, the results have been the massive commitment of Crown forests to the woodchip industry, redirecting, on a large scale, the time, expertise, and funds of the Forestry Commission. The role of the Commission in woodchip areas has been described in section 3.1 (Table 3.3).

This sub-section is a review of the public costs and revenue associated with Forestry Commission involvement in the export woodchip industry. Information is largely drawn from Forestry Commission annual reports and other government publications.

In 1972, soon after APPM and Forest Resources received their first consignments of pulpwood for export, two senior staff members of the Forestry Commission published an article detailing the revenue and discounted costs associated with timber production from four basic forest types in Tasmania (Gilbert and Cunningham 1972). Ten years later, a fellow senior staff member, B.B. Walker presented a paper at a forestry conference that included commentary on royalty rates and road tolls under existing legislation (Walker 1981). In both cases, the conclusions reached were very similar: Forestry Commission revenue was substantially below the real costs of production. Given the early warnings of Gilbert and Cunningham (1972) the question arises as to why it appears little was done to improve the situation in the following decade.

In 1967-68 total timber production from both native forests and softwood plantations on Crown land amounted to 1.2 million cubic metres, 31% of which came from native forests for local pulpwood consumption

(Table 3.25). During that year, the Forestry Commission incurred a deficit of $5.7 million (1982 dollars). Ten years later, in 1977-78, total timber production had increased dramatically to 2.2 million cubic metres, due almost entirely to increased pulpwood production by the woodchip industry; however, despite these increased sales, the Forestry Commission deficit had grown even more dramatically by 200% to reach $15.7 million (1982 dollars). In other words, the public body delegated to manage and sell Crown timber was selling twice as much timber in 1977-78 as in 1967-68 but were losing three times the amount of money previously lost annually. This situation has coincided with the full development of export woodchipping in Tasmania. During the period beginning with full woodchip production up until 1980-81, the Forestry Commission deficit grew from $7.7 million to a peak of $15.7 million in 1978-79, subsequently declining to $10.5 million in 1980-81 (1982 dollars).

This recent decline in the Commission's deficit is largely due to a combination of two factors: higher royalty rates for both pulpwood and sawlog and increased sales (higher royalties for pulpwood may have coincided with the expiration of contractual agreements for royalty rates between the companies involved and the Government). Since expenditure by the Commission remained relatively constant during this period, the increased pulpwood royalty rates suggest official recognition of the poor return the public were receiving for Crown timber.

The $8 million deficit increase between 1973 and 1978 occurred at a time of fluctuating demand for timber, particularly Tasmanian sawn timber destined for the Victorian market. However, such fluctuations do not appear to be of the level required to explain the sharp deficit increase (Table 3.25). The 1974-75 Forestry Commission Annual Report mentioned the damaging effect of inflation on costs; but in order for inflation to have an effect on the deficit in real terms, costs must have increased over and above the rate of inflation. Given that this

TABLE 3.25

Trends in Forestry Commission deficits and timber production from Crown land: 1968 - 1981[a]

Year	Pulpwood Production - Native Forests m^3	Forestry Commission Deficit $ (1982)	Total Timber Production - Native Forests and Soft-wood Plantations m^3	Pulpwood Production of Total Timber Production %
1967-68	378 400	5 729 821	1 231 947	31
1968-69	363 970	6 230 109	1 223 742	30
1969-70	405 320	6 468 956	1 270 308	32
1970-71	433 989	7 081 923	1 234 593	35
1971-72	681 000	7 059 448	1 511 000	45
1972-73	1 036 000	7 792 034	1 866 000	56
1973-74	1 506 000	7 379 812	2 403 000	63
1974-75	1 614 000	9 355 136	2 502 000	65
1975-76	1 353 000	13 623 880	2 120 000	64
1976-77	1 437 000	14 270 036	2 189 000	66
1977-78	1 523 000	15 772 486	2 279 000	67
1978-79	1 472 000	14 453 149	2 234 000	66
1979-80	1 811 000	11 826 218	2 731 000	66
1980-81	1 902 000	10 564 185	2 915 000	65

[a] TASMANIA, FORESTRY COMMISSION, 1968-1981; *Annual Reports 1968-1981;* Government Printer, Hobart.

may have occurred, it seems acceptable that any increases in real costs should be offset by increased royalties associated with major expansion in pulpwood production (Table 3.25). Clearly this did not occur; by way of crude approximation it appears, at least superficially, that the woodchip industry contributes some $2-3 million annually to the Forestry Commission debt. Of course, many factors will influence the accuracy of this estimate. If pulpwood royalties continue to increase one can expect the deficit to decline. On the other hand, the Forestry Commission has not paid interest on capital borrowings made between 1971-1981 (personal communication, D. Inglis Forestry Commission 1982). The Commission is required to do so from 1982 onwards with a resultant increase in a major item of expenditure.

In order to give added weight to the implication that woodchipping 'caused' increases in forestry expenditure over and above revenue, a table has been constructed showing statistical correlations between timber production and financial trends over the decade 1968-1978 (Table 3.26). While these correlation co-efficients do not prove causality, it is evident that changes in both revenue and expenditure were highly related to fluctuations in pulpwood production. Sawlog production appears to be far less significant. The correlation between pulpwood production and the Forestry Commission deficit is statistically significant, and considerably greater than the correlation between the Commission's deficit and sawlog production.

Much of the suspicion surrounding public subsidization of export woodchipping was confirmed in a detailed financial analysis undertaken in 1978 of the activities of the Forestry Commission in TPFH concession areas (Tasmania, Forestry Commission 1978). Over a full rotation in which all existing commercial forest under the working plan would be cut (100 years), it was found that the discounted revenues generated by pulpwood and sawlog royalties current at that time, did not cover the

TABLE 3.26

Correlation co-efficients for variables related to Forestry Commission revenue and expenditure 1968-1978[a]

Correlation	Co-efficient (r^2)
Sawlogs Production -	
X Revenue	0.01
X Expenditure	0.24
X Deficit	0.34
Pulpwood Production -	
X Revenue	0.94
X Expenditure	0.73
X Deficit	0.51

[a] TASMANIA, FORESTRY COMMISSION, 1968-1978; *Annual Reports 1968-1978;* Government Printer, Hobart. Pulpwood production excludes softwood plantations.

Note: Correlation co-efficients are a statistical means by which to measure the strength of relationship between two variables. In other words, the co-efficient shows how much the fluctuation or change in one variable dependent on change in another. As mentioned in the text a co-efficient of 0.5 is marginally significant while 0.9 indicates a very strong relationship.

discounted costs. These costs were mostly connected with regional and head office management and regeneration. The conclusions reached in the analysis may have proven more disturbing had it not been assumed that all sawlog royalties should be included in an economic appraisal of a woodchip operation. Furthermore, the analysis used a rotation period of 40 years; already it appears that it may take 50 years for regrowth to be available for woodchipping (Hawes 1981). This would increase the negative net benefits of the project.

The conclusions reached in the TPFH analysis directly contradict the findings of an earlier Commonwealth report on the"Economic and Environmental Aspects of the Export Hardwood Woodchip Industry" (Cromer

et al. 1975). In relation to Forestry Commission involvement with the TPFH project,this report concluded that "over the range of overheads allocated to the project as shown, the Tasmanian Forestry Commission should not make a loss out of the East Coast project" (Cromer *et al.* 1975).

The TPFH analysis provides a precedent for similar studies in other woodchip areas managed by the Forestry Commission. Available information suggests the situation is likely to prove even less favourable. The TPFH study employed three different understorey types or difficulty classes in order to determine regeneration costs. These roughly correspond to the forest types known as dry sclerophyll, wet sclerophyll, and rainforest. These last two types occupied only 11% of the total commercial forest in the concession areas but represented 44% of the total regeneration costs (Tasmania, Forestry Commission 1978). The Forestry Commission (1975) has estimated regeneration costs for wet sclerophyll forests to be five times higher than those for dry sclerophyll forests. The Wesley Vale concession areas and the North West both have a high component of wet sclerophyll forest. Approximately 100 000 hectares or one-third of commercial forests in the Wesley Vale region are classified by the Forestry Commission as wet sclerophyll forest (personal communication, B. Gordon Forestry Commission 1982). The percentage of this forest type is likely to be much higher in the North West, which contains a large proportion of Tasmania's cool temperate rainforests.

In conclusion, it would seem likely that regeneration costs per hectare would be much higher for the remaining two woodchip areas not yet examined on a financial basis. Other costs are also likely to be greater. The Forestry Commission is responsible for a large percentage of road construction and maintenance in the North West and North East

of the State (these costs are not significant for TPFH operations, as the company constructs and maintains roads within its own concession areas). In 1981 total expenditure by the Forestry Commission on roads in native forests amounted to $3 million, 74% of which was spent in the North West and North East regions (Tasmania, Forestry Commission 1982). Road tolls for the year amounted to $1 million, slightly less than total maintenance costs. The $2 million difference does not automatically represent a public loss if and when such roads are made available to the public. The suggestion here is that the public should be prepared to partly subsidize roads which it may eventually use. On the other hand, it would seem reasonable to at least recover the costs of constructing and maintaining forestry roads from those for whom the roads were originally built and will use again when the forests are reharvested. This is not occurring in Tasmania at present and is most unlikely to occur considering that current revenue received does not even cover maintenance costs.

The results of the TPFH Financial Analysis (Tasmania, Forestry Commission 1978), when viewed in conjunction with observations of other woodchip regions, strongly reinforce the original contention that the public, via the Forestry Commission, is subsidizing the woodchip industry by as much as $2-3 million per annum.

A final point should be made. Forestry Commission woodchip operations should be regarded as deferred investments in a category similar to plantations. From this, it would appear that while timber production costs for the current initial rotation are zero and that full production costs for regrowth timber will be recouped at the time of harvesting, it does not follow that revenue from the initial rotation is 'pure profit'. Any such impression is incorrect because, during the final rotation, costs are incurred but no revenues are obtained. As difficult as it is, revenue from the initial rotation must cover

the costs of establishing the final rotation. Wallace (1974) has suggested that "These costs may be able to be approximated by the current replacement cost in the initial rotation. Therefore, the criterion for royalty determination is that present royalties must cover current replacement cost...".

The evidence outlined in this section suggests that this is not occurring in relation to the export woodchip industry.

3.3.4 Conclusion

To suggest that Government departments generally operate at a continual expense to the public is not new. It is assumed that by doing so, the community benefits in the long-term. However, questions still remain as to how much the public should be prepared to spend on providing services to private industry. This is poignant if the costs appear too high and better investment can be made elsewhere.

The Tasmanian road network has been constructed and maintained at public expense. The taxes, levies, rates and tolls applied to fund this expenditure are seemingly accepted by the public in exchange for the net benefits such as a road on which to drive. If, however, the community is paying about $6 or 7 million annually (a mid-range estimate between the two figures calculated in Section 3.3.2) for woodchip companies to use public roads, serious consideration must be given to the value of the industry and, certainly, consideration must be given to applying the 'user-pays' principle.

The situation with regard to the Forestry Commission is different in that the Commission has the responsibility of *selling* a major public resource. In doing so, it would seem rational to at least make a small profit. Instead, the Forestry Commission is losing up to $3 million annually on its woodchip operations. As pointed out in Section 3.3.3, to claim that such losses represent an investment in the future is to

incorrectly switch the accounting picture.

Public subsidization of railway operations is far more difficult to quantify. From current trends it would appear unlikely that Australian National Railways will recoup the $35-40 million capital outlay, plus interest, for the Bell Bay railway project.

There are other areas of public expenditure on woodchip infrastructure that have not been examined; examples include the provision of power facilities, sewerage works and housing. Nonetheless, the major sectors examined reveal a public subsidy to the woodchip industry in the vicinity of $10 million annually. This represents a minimum figure and should be treated with caution as it is based on many assumptions and a restricted data base. However, the figure suggests that greater attention should be paid by the State to the degree of public subsidization and the extent to which the community is prepared to pay to keep the woodchip industry.

CHAPTER 4

COMPARISON OF THE REGIONAL IMPACT OF THE WOODPULP AND EXPORT WOODCHIP INDUSTRIES IN ESPERANCE AND SPRING BAY

Forest industries have increasingly been recognized as making particular economic contributions, and causing certain social changes, in localized, often rural areas. Earlier, basic socio-economic statistics were used to describe forest industries in the context of Tasmania's economy with special reference being made to particular regional economies. Further narrowing of the focus allowed the development of an empirical base from which some costs and benefits associated with one particular forest industry, export woodchipping, could be gauged on a statewide level. This chapter is intended to go another step further to examine in detail the social and economic influences of a large and centralized forest industry on two essentially different communities: Esperance and Spring Bay municipalities. Such an analysis will complement the more general earlier discussions of the social and economic effects of forest industries since the repercussions of establishing a woodchip industry which has statewide implications have their major impact at the regional level. The areas chosen represent two identifiable, rural-based economies experiencing the influx of a centralized and major forest-based industry, ten years apart. Through a comparative study of the economic and social changes brought about by the woodchip industry in Spring Bay and the woodpulp industry in Esperance it will be possible to better understand the effects of major forest industries on other local communities. Furthermore, such regional profiles provide some background to community and group attitudes which are discussed later in this chapter and again in Chapter 5.

Demographic, social and economic changes do not occur in a vacuum, they occur largely as a result of prevailing, often external, economic factors and the particular historical antecedents that determine the 'character' of an area. These determinants have a varying input into those socio-economic changes discussed in the following sections. In order to indicate the historical 'character' of each municipality the

chapter begins with a brief history of the areas. It will become apparent that Esperance has had a long and extensive involvement in the timber industry. On the other hand Spring Bay has never supported any major forest-based industry, until the advent of export woodchipping in the early 1970s. The final two sections cover employment, economic, social and demographic changes that have occurred in both areas. Firstly, a brief description of each area will be given.

4.1 INTRODUCTION TO THE MUNICIPALITIES

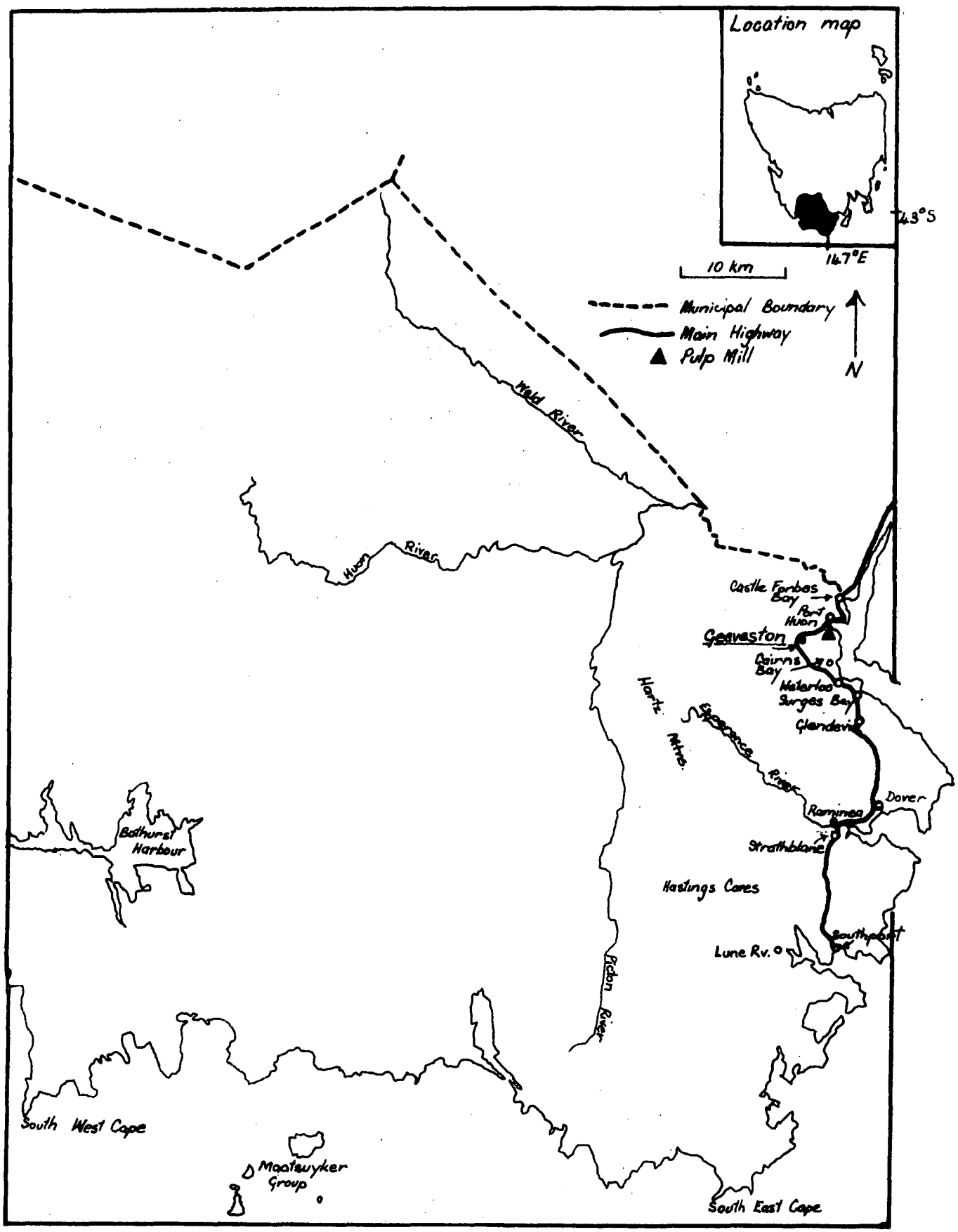
4.1.1 Esperance

Esperance is the most southern of Australia's municipalities covering an area of 618 472 hectares extending from Castle Forbes Bay across to the junction of the Serpentine and Gordon rivers and south to Port Davey. It also includes Macquarie Island, 1460 km to the south (Figure 4.1).

A major portion of the municipality is made up of the mountainous and uninhabited regions of South West Tasmania. Prior to European arrival much of the accessible land was heavily timbered. Settlement itself has been largely confined to a narrow hilly strip running the length of the eastern coastline. The associated problems of land clearance, a high average annual rainfall, and topography, have all combined to create a dominant agricultural activity; the pome fruit industry. Although the industry has declined since the mid 1960s, the municipality is still the second largest apple producing district in Tasmania. The orchards are concentrated in the Geeveston district which is also the site of APM's semi-chemical pulp mill which has been in operation since 1962. The company has exclusive rights to pulpwood from the wet sclerophyll forests of southern Tasmania. Sawlogs from these forests have formed the basis of a sawmilling industry, the

FIGURE 4.1

Esperance municipality: location of main features



predominance of which, both historically and economically, has greatly influenced the community.

South of Geeveston, a major onshore and offshore fishing industry operates out of Dover on Port Esperance. As of July 1981, 41 of the 50 registered fishing boats in Esperance were situated at Dover (personal communication, Tasmanian Fisheries Development Authority 1981). Further south, Southport is primarily a recreation destination for holiday makers and a retirement village.

Since the mid 1960s, a decline in the apple and sawmilling industries has been reflected in a population loss of 18.6%, numbers falling from 3740 in 1966 (Commonwealth Bureau of Census and Statistics 1968) to 3044 in 1981 (Australian Bureau of Statistics 1982a). Further closure of local mills and continuing market problems within the apple industry are likely to create further outmigration.

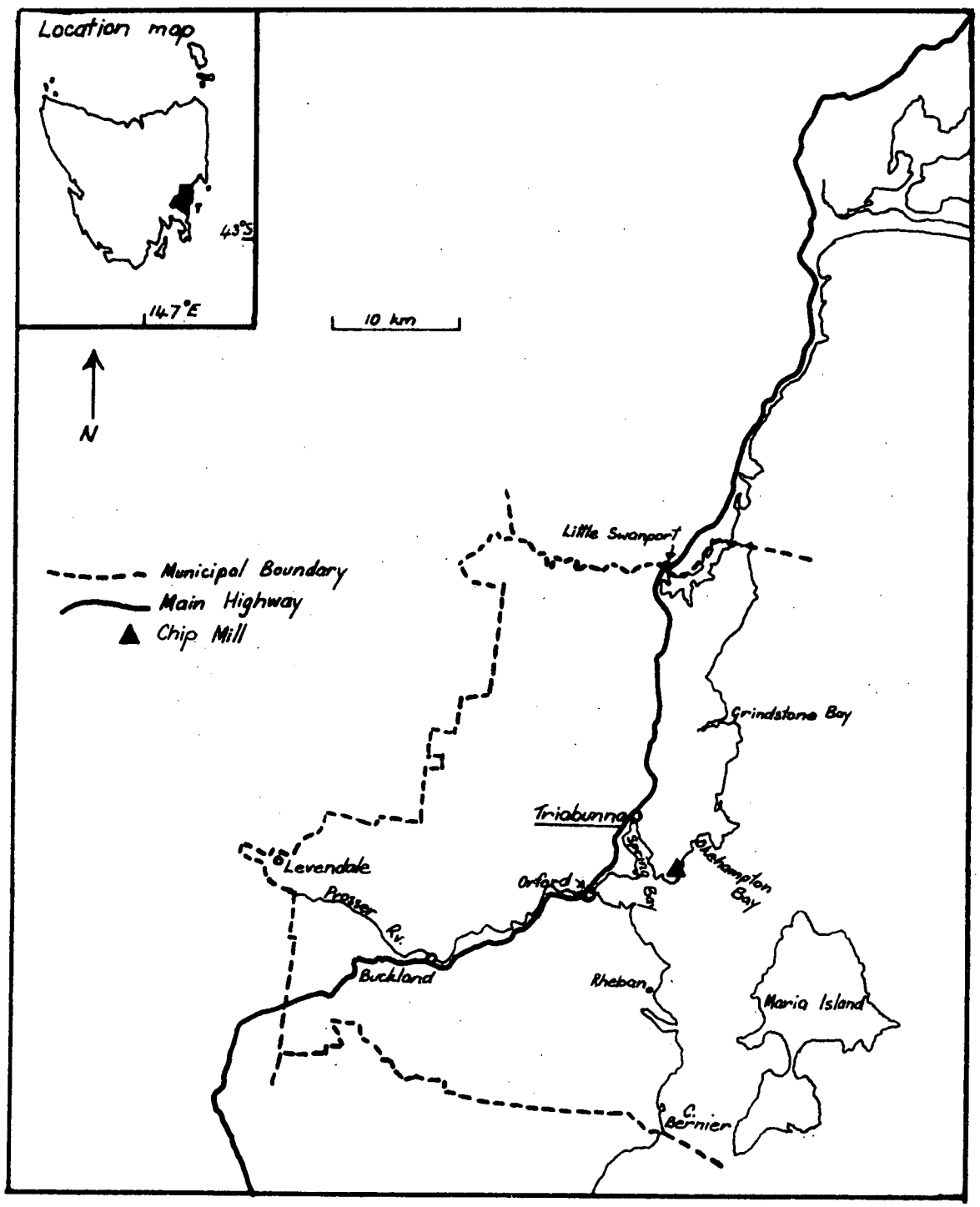
4.1.2 Spring Bay

The municipality of Spring Bay, situated on the East Coast of Tasmania (Figure 4.2) has an area of 112 117 ha (J. Walch and Sons 1980). Bounded in the north by the Little Swanport river and in the south by an imaginary line from Mt. Morrison to Cape Bernier, it also includes Maria Island. One of the earliest municipalities founded, in 1860 (Rait 1960), it encompasses principally a hilly landform with areas of undulating country near the coast and beside the two major rivers, the Prosser and Little Swanport. The average annual rainfall is 625 mm and hence water, as well as topography and soils, has influenced the degree and nature of the agricultural activity established in the region. Such activity has largely focussed on sheep and, to a lesser extent, on cattle farming.

The Spring Bay population has increased markedly over recent years. From 1911 to 1967, the population grew slowly from 751 (Reid 1978) to

FIGURE 4.2

Spring Bay municipality: location of main features



1217 (Commonwealth Bureau of Census and Statistics 1968); by 1981 the figure was 1885 (Australian Bureau of Statistics 1982). The municipal administrative centre, Triabunna, is situated on the shores of the only safe, deep water port on the East Coast. It has consequently been the focus of development in the municipality. In the past, almost all agricultural produce was transported by sea. More recently, the port has been the centre of an extensive onshore and offshore fishing industry as well as the location for Tasmania's first export woodchip mill (set up by TPFH).

While Triabunna has been the main focus of industry in the area, the mild East Coast climate and pleasant environment have been responsible for Orford (the second largest population centre) developing as a holiday and retirement village. The only significant inland population centre, Buckland, caters mostly for outlying farms and for tourists travelling further up the coast.

4.2 AN HISTORICAL PROFILE OF ESPERANCE AND SPRING BAY

The following historical information, designed to provide a comparative view of development between the two communities, is largely drawn from postgraduate research work, newspaper articles and personal interviews. In contrast with Spring Bay, it has been possible to examine the Esperance timber industry in some detail due to the greater attention paid to the region by historians.

4.2.1 Esperance

In 1851, at the same time as the Geeves family was pioneering the area now known as Geeveston, Henry Weston, an immigrant to Tasmania wrote of the Huon district†: "The land is most heavily timbered, costing

† includes the Huon, Port Cygnet and Esperance municipalities.

twelve pounds per acre to clear, and in many respects a most objectionable settlement for the best class of colonists" (Martin 1968). This observation highlights two fundamental characteristics of settlement in Esperance: firstly, the relative isolation and inherent difficulties of the environment, and secondly, the social background of its pioneers.

Row (1977) has described the period 1800-1840 as a period of 'experimentation' and 'behaviour adjustment' as people adapted to an alien environment. During this period most of Esperance was densely forested. However, there was very little official interest shown in the hardwood resource with most timber production being used for local consumption. The timber-getters themselves were hardworking labourers, ex-convicts, and 'ticket-of-leave' men (Martin 1968). The convict system of itself had created, by default, an unskilled and unemployable group of men whose only expertise, quite often, was in timber production (Kemp 1981). As pointed out by Kemp: "Thus it unfortunately passed into Tasmanian folklore that men in the forest industry were hardworking but an intellectually dull and criminal lot". Many of these men were to become the first permanent settlers in the Huon district.

Settlement itself gained impetus following the purchase of some 640 acres at Franklin by Lady Jane Franklin (Goodhand 1961). This settlement provided a staging point for further settlement both up and down the Huon district. Land grants were made by the colonial Government with a cleared block of 10-15 acres considered to be sufficient. Due to the impenetrable nature of the forest it took some years before the block could be cleared. (Goodhand (1961) has suggested that the highly intensive nature of commercial orcharding on small blocks in the Huon, owes much to the extremely arduous task of initially clearing the land.) The newly-acquired land was then planted with food crops such as potatoes or fruit to meet the immediate needs of the pioneering families. Timber cutting often acted as a supplementary income: "The

pioneer families were forced by isolation, the uncertainty and high prices of supplies, to strive for a high degree of self-sufficiency" (Goodhand 1961).

It was not until the period 1870-1890 that the fruit industry began to operate on a significant commercial basis. This followed the growing demand for Tasmanian apples on overseas markets, particularly the United Kingdom, and the development of adequate refrigeration techniques to transport the produce (Goodhand 1961). Growth was also hastened by increased specialization of varieties and the need for professional management of orchards to counter various pests and diseases (Goodhand 1961).

By the mid-nineteenth century the Esperance area had been settled by pioneers with a working-class or convict background, effectively isolated from each other and the colony as a whole, and eking out an existence from an alien environment. If there was an educated middle-class, it was small and ineffective (Martin 1968). One of Huon's earliest representatives in the Legislative Council, John Donellan Balfe, a staunch critic of the anti-transportationists, has been described by Martin (1968) as "conservative, crude and with an uncouth style, [but] ...this was what the people in the Huon wanted, and that it was only he who could make them forget their feelings of isolation and inferiority by identifying with his extraordinary crudity and vitality".

Although fruit growing has been of prime importance, Esperance has maintained close links with the timber industry since its early inception. The first sawmill in Esperance, the second in Tasmania, was built by Peter Graves at Southport in the early 1820s (Kemp 1981). This mill was somewhat atypical in that it was not until the 1850s that sawmilling became fully established. The years 1850-1870, "a period of great expectation" (Row 1977) heralded the first of a series of 'boom-bust' cycles that were to plague the sawmilling industry even until the

present. The period began with an unparalleled demand for sawn timber, created by the Gold Rush and urban expansion in Victoria (Kemp 1981). In 1853, 150 000 m^3 of timber, representing one-quarter of Tasmania's total export earnings for that year, were exported to the mainland and overseas (Row 1977). By 1859, the number of sawmills in Tasmania had increased to 22 (Kemp 1981) with mills being set up at Hospital Bay, Port Esperance and further south (Tasmania, Forestry Department 1928). Prime forests within the immediate vicinity were exploited through the use of wooden tramways. The economic feasibility of hauling logs long distances only came following the advent of steel tramways.

The prosperous 1850s were soon to end with the collapse of the Gold Rush and greater export competition from Canada and the U.S.A. (Kemp 1981). Contrary to popular belief, income from the sawn timber trade rarely exceeded 5% of total export earnings in any one year from 1860 onwards (Row 1977).

The late 1880s proved a difficult time as overseas markets contracted and other Australian states increased their own internal competitiveness by placing duties on imported Tasmanian timbers (Kemp 1981). The following depression of the 1890s, witnessed the closure of many sawmills in the Esperance area (personal communication, L. Geeves 1981). Clearly, there was a need for some major changes; these came in the form of the Crown Lands Amendment Act 1890 and from structural changes within the sawmilling industry itself.

The basic import of the Amendment Act was to guarantee secure access to forests for the sawmilling industry through Crown land leases of up to 5000 acres. The Act foreshadowed the restructuring of the timber industry following the influx of overseas capital and expertise (Row 1977). Larger, more capital intensive sawmills were set up necessitating large-scale exploitation of an already seriously depleted resource. Notable examples were the Huon Timber and Tramway Company and

the Tasmanian Timber and Tramway Company, both situated in Esperance. While these larger mills attempted to obtain a greater share of the export market, other mills, having experienced a high degree of instability, were beginning to re-orientate production to provide the box-timber requirements of the fruit industry. (Fruit was being packed and transported in one bushel wooden cases constructed from locally available hardwood.) During the early twentieth century the fruit industry was undergoing a period of major growth following intercolonial trade expansion and relaxation of duties and tariffs after Federation (Dell 1968). As shown later, restructuring along these lines did provide much needed security to the Esperance sawmilling industry; it also meant that a large section of the industry was now heavily dependent on the continued prosperity and requirements of the apple and pear industry.

Two major developments occurred in the 1920s that were to have a significant impact on the Esperance community. Firstly, the large centralized sawmills proved an economic liability and became a financial loss to foreign investors. Several factors could explain this. Much of the better and most accessible timber had, by then, become overcut creating the necessity to push tramways further back into the forests (personal communication, L. Geeves 1981). The 1920s also witnessed increasing competition from overseas imports on the mainland, restricting the demand for Tasmanian timber. The second major development was a pilot pulp and paper mill built in 1927 by Tasmanian Pulp Pty Ltd on the same site as the failed and dismantled Huon Timber Co. mill. Although the mill soon closed, primarily due to the 1929 Wall Street crash, it proved the technical feasibility of producing paper from eucalypt fibre.

The 1930s depression saw an unprecedented drop in timber production: from 153 million super feet in 1926-27 to 19 million in 1930-31

(Kemp 1981). From 1930 to 1931, the production value declined by 54% from $817 000 to $377 000 (Commonwealth Bureau of Census and Statistics 1932). As the number of operating mills in Tasmania decreased slightly, many mills would have been operating on a part-time basis. Such fluctuations appear to have had little effect on the Esperance population. It had been slowly declining from 3838 in 1911 (Commonwealth Bureau of Census and Statistics 1912) to 3280 in 1930 (Commonwealth Bureau of Census and Statistics 1930) but overall, the population increased throughout the 1930s, 40s and 50s, to peak again at 3740 in the mid-sixties.

By the late 1930s, the sawmilling industry had recovered and was again experiencing boom conditions. In Esperance itself, a nucleus of well-established mills was providing sawn timber primarily for local consumption. As mentioned previously, the majority of smaller mills had consolidated production in line with the requirements of the fruit industry. The 'box' sawmilling industry produced approximately 6-8 million cases per year from small operations utilizing high quality logs, though often of a smaller diameter than those used by the larger mills (personal communication, N. Beck 1981). Each mill employed approximately five men, 1-2 cutting and hauling in the bush with 2-3 employed at the mill itself (personal communication, N. Beck 1981). Up until the mid 1960s there may have been 30-40 such mills in the Esperance district. Thus employment for some 200 men was provided for up to nine months of the year, the rest of the year spent doing seasonal work in the apple industry or on the wharves loading fruit.

In the late 1940s and early 1950s, the Forestry Commission undertook to assess the forest resource in southern Tasmania with a view to attracting a pulp and paper industry to the area. In order to provide legislative encouragement, the State Government subsequently passed the Forestry Act 1954. The holder of a special licence under this Act is

entitled to exclusive rights to all pulpwood in both the pulpwood and reserve areas (covering most of the commercially valuable forests of southern Tasmania) for a period of 80 years. APM became interested in the area as a site for a semi-chemical pulp mill in 1958. That such an industry was possible at all owes much to the pioneering work of Tasmanian Paper Pty Ltd, conducted on the same site some thirty years before.

Following detailed investigations and negotiations, APM was granted a special licence with attendant rights and obligations in 1960. Mill construction commenced in 1961. At the time, it was locally believed that a paper mill would be built within five years, but this did not eventuate.

The Port Huon mill produces two kinds of semi-chemical pulp depending on the mixture of oldgrowth and regrowth timber used (Australian Paper Manufacturers 1975). After undergoing mechanical and chemical pulping, the bulk of the final product, pelletized pulp, is then shipped to the company's paper and paperboard mill at Botany in New South Wales. The pelletized pulp is largely used to improve the efficiency of manufacturing corrugated paper, used mostly for packaging (Australian Paper Manufacturers 1975). In 1980-81, the company shipped approximately 200 000 tonnes of pulp to the mainland (Tasmania, Forestry Commission 1982).

The setting up of a pulp industry at Port Huon occurred simultaneously with the restructuring of the local sawmilling industry. The export marketing advantages of using cartons instead of boxes foreshadowed the end of the 'box' sawmilling industry. With the aid of Government pressure, the use of cartons was gradually phased in from the early 1960s onwards; consequently the 'box' sawmilling industry began to contract in size. By the time the fruit industry was experiencing the beginning of its own decline in 1966-67, there were no more

'box' mills left in Esperance. A more recent development within the sawmilling industry, both statewide and in Esperance, is the buying out of smaller mills leading to the processing of timber in centralized urban areas, such as Hobart, Launceston and Burnie. This trend towards greater centralization has led to both relocation and loss of Esperance jobs to Hobart. In 1955, there were 31 sawmills in Esperance; by 1972 the number had declined to 19 (see Table 4.5). Currently there are only four privately-owned sawmills in the municipality (personal communication, A. Swan 1981).

The historical development of Esperance has been inextricably linked with the fortunes of the fruit and timber industries. Changes within these industries have foreshadowed a decline in importance of the sawmilling industry, while at the same time timber harvesting has now focussed on the production of pulp. Connections with the timber industry have been essential for economic well-being and have created within the community a distinctive type of character or identity who, in some ways, is a reflection of those early pioneers associated with the timber industry.

4.2.2 Spring Bay

Until the early 1970s, the Spring Bay community's involvement in the timber industry had been negligible. Consequently, and in marked contrast to that of Esperance, its economic development, and thus the major factors affecting community structure and characteristics, have not traditionally been associated with timber production; rather Spring Bay has a traditional connection with pastoral development in conjunction with fishing.

Strictly speaking, European association with Spring Bay began with the whaling industry, the activities of which preceded and gave rise to, the first permanent settlement. During the early 1800s, Oyster Bay

on Maria Island was well known as an excellent site for bay whaling. The industry was so named because whales (commonly black whales) were first sighted from lookouts on land from which relayed messages were sent out to the pursuing longboats. Once harpooned, the whales were dragged ashore and carved up, mainly for lubricant, soap and fuel (Reid 1978).

Following the relaxation of heavy duties imposed on whale oil in England in 1828, there followed a boom in bay whaling in the 1830s (Hartwell 1954). According to one estimate, there were approximately 300 men employed in some aspect of whaling on the East Coast (Hartwell 1954). The industry was to spawn a flurry of small manufacturers, producing items such as harpoons, lines, flenzing knives and Huon pine boats. In Spring Bay alone, there were at least four whaling stations, two of which were situated on Okehampton and Grindstone Bays where settlement first began (Reid 1978). By 1840, overhunting had eliminated the black whale from East Coast waters and the whalers who had so relentlessly pursued them left the district.

The first indication of permanent settlement in Spring Bay was the recording of stock-keepers on the stock station of Mr. Silas Gatehouse at Grindstone Bay in 1821 (Rait 1960). The first official land grant was given to Mr. Peter Maclaine in 1829, on the outskirts of what is now the town of Triabunna. By 1830, the total area of land held under grants or location orders was 36 000 acres (*Central Coast Courier*, 25 November 1981). Not all of this area was in Spring Bay, which was then part of what was known as the Oyster Bay District. Most of the grants were divided between a few large pastoral holdings many of which were run by retired members of the military. One such member, Major Lord began his association with the East Coast as an early commandant at the penal settlement on Maria Island. The settlement itself was only to last seven years, from 1825-1832, although it was to reopen

again in 1841 as part of a newly introduced probationary system (Reid 1978). The settlement was finally abandoned in the mid 1850s due to the political success of the anti-transportationists.

A large proportion of the early grants were for grazing, setting the pattern of land use up until the present. By 1830, 1200 acres of the 36 000 acres granted had been cleared and over half of this had been sown, predominantly with wheat. At the same time there were 2500 head of cattle and 17 000 sheep (*Central Coast Courier*, 25 November 1981); a proportional situation that still exists today (personal communication, D. Secomb Department of Agriculture 1982). In the early years, Tasmania (or Van Diemens Land), in conjunction with other Australian states, developed a healthy export trade in merino wool to Britain, in which the Spring Bay graziers participated (Hartwell 1954). Most agricultural produce (and passengers) travelled by sea due to the often hazardous and rudimentary nature of road transport to Hobart. Growth in agricultural prosperity and trade led to a population increase in the district. With a population of about 230, the Spring Bay community petitioned the central Government for municipal status. This was granted on the 10th of September 1860, under the newly passed Rural Municipalities Act of 1958 and made Spring Bay the second local government area to be declared in Australia. In keeping with common experiences for local government in rural areas, many of the well established, substantial land owners had considerable influence in local council. Of the six successful candidates in 1860, five were in this category (*Central Coast Courier*, 10 November 1981). That this tradition has continued until very recently partly reflects the dominant role played by large land holders within the Spring Bay community. In the early years, it also reflected the prejudiced nature of the voting system which effectively denied voting rights to non-property owners (*Central Coast Courier*, 28 October 1981).

The municipal chambers were situated in Triabunna. The town's location on the only safe deep water port along the East Coast guaranteed its position as the hub of major agricultural resource developments in Spring Bay. These developments will be the focus of the rest of this short history.

In 1903, Henry Jones and Company Pty Ltd purchased the Rostrevor Estate (just north of Triabunna) from the Vicary family. Originally a grazing property, the site was chosen as the location for an extensive orchard which covered over 200 ha at its peak and supported a viable apple and pear industry. The choice of land was undoubtedly influenced by its close location to port facilities and reflected a general feeling of optimism within the fruit industry as overseas markets expanded. Goodhand (1961) has suggested that this orchard was unique in Tasmania in that it represented "...the speculative development of a large pome fruit plantation by a Hobart canning company". It was, however, a speculative enterprise that eventually proved a failure. By the mid 1950s, the orchards had declined to 113 ha. The contraction resulted from the economic difficulties confronting the fruit industry following the orchard boom, exacerbated by the choice of an unsuitable location (largely due to low and unreliable rainfall). Finally in 1971, when the fruit industry was further depressed due to the admission of Britain to the European Economic Community, Rostrevor Estate was bought by a local grazier, the orchards cleared, and the land converted to pasture (McCuaig 1981a). During its lifetime, the Estate provided permanent employment for 20-30 men and for many additional casual workers during the picking season (McCuaig 1981a).

Spring Bay has had a viable fishing industry since the early 1930s. As the importance of orcharding declined, so that of fishing rose, particularly the importance of onshore operations. In 1960, about 70 boats were reported to be operating out of Triabunna (*Mercury*, 10 October 1960).

By 1981, the number had declined to 29 registered boats, 22 of which are located at Triabunna (personal communication, Tasmanian Fisheries Development Authority 1981). The decline in boat numbers has been mirrored by a similar reduction in the total catch (McCuaig 1981a). Although their numbers have declined, the fishermen still represent an obvious and distinctive social group within the community.

Onshore activities related to fishing encompass processing and packaging of the fishermen's produce as well as boat construction and maintenance. Three different shore-based processors were competing for the fishermen's catch in the late 1950s. However, overcommitment forced two out of the market, one being replaced by Safcol (Tas.) Pty Ltd. Onshore processing assumed a position of increasing importance within the municipality as production at Rostrevor Estate wound down during the 1960s and early 1970s. There were two other sea-related developments that fulfilled a similar position and deserve a minor mention.

In 1963, Alginates (Aust.) Pty built a factory and associated facilities to harvest and process kelp growing in beds just off the East Coast for the production of sodium alginate. Despite detailed investigations by both Government and company, the kelp supply proved insufficient and the industry closed down in 1973. Meanwhile, another company, Fish Protein Concentrate, established a plant on the shores of Spring Bay in 1973 intending to harvest large quantities of school fish which were otherwise unmarketable, in the production of fishmeal (for use predominantly in chicken feed). Fish Protein Concentrate was only to last three years; in that time, the company encountered problems with its resource base while incurring a $3 million debt and the alienation of Triabunna residents due to the foul stench associated with its operations.

Natural resource development in Spring Bay was not confined to the

sea: there were forests that could be harvested for timber; however, there were limitations. Unlike the tall wet forests of Esperance, the dry open forests of the East Coast have not provided an adequate resource base for a major sawmilling industry. The quantity of millable timber varies from area to area. In high quality areas, the sawlog to pulpwood ratio may be as high as 1:3 while, in many areas, it may be as low as 1:20 depending on various environmental factors and the degree of human interference (personal communication, J. McDonald Forestry Commission 1981). Despite these disdavantages, a small sawmilling industry has survived since at least the turn of the century. The largest mill, situated at Weilangta on the Sandspit river, was built by Russell Allport and Company around 1910 (personal communication, B. Chesterman 1982). The mill employed between 30-40 men with the sawn timber being shipped to Hobart. Bought by the Huon Timber Company in the early 1920s, the mill closed not long after the new owners ceased operations at Port Huon in the late 1920s. A smaller sawmill was set up in the same area, but this also closed down shortly after the Second World War (personal communication, B. Chesterman 1982).

Two sawmills in the Buckland area were to suffer a similar fate. The Buckland Timber Mill, opened in 1948, was the only major secondary industry in the Buckland area and was unique amongst sawmills on the East Coast in that it was capable of cutting long lengths of timber (*Central Coast Courier*, 26 August 1981). Closed in 1981, its machinery and equipment have been moved to the single remaining sawmill in the municipality, Spring Bay Timber Company, Triabunna. The relatively short life-span for sawmilling enterprises and the small number of sawmills in Spring Bay emphasize the lack of bushworking traditions or significant historical role played by the sawmilling industry in the area. There has never really been a distinct and noticeable group of timber workers in the way that fishermen and farmers have a long association

with the community. Woodchipping has drastically altered this situation.

Prior to the formation of TPFH little interest had been shown in the potential of the East Coast forests as a source of pulpwood. Arguments in favour of developing a woodchip industry did more than re-orientate official perceptions of the forests; they also provided impetus to a community under threat of decline as other sectors wound down. The genesis and expansion of TPFH have previously been outlined in sub-section 3.1.1. Suffice it to say that woodchipping became the most significant employer within the community within a short period of time. The traditional dependencies of fishing and agriculture took on lesser roles, particularly in Triabunna. The two other population centres, Orford and Buckland, were not as directly affected.

In summary, the history of Spring Bay has been that of a small relatively static, closely-built community, isolated from change with a narrow, largely rural-based economy. To a certain extent, the same can be said about Esperance, particularly regarding its isolation (to the extent that it has developed many of its own colloquial expressions). Esperance is, however, a larger community, having experienced significant fluctuations in its population. At least three major industries have survived for some time including orcharding around Geeveston, fishing in Dover and sawmilling throughout the municipality. In terms of the social impact of a large, centralized forest industry, it is the relationship, both past and present, between the timber industry and the local community that should significantly influence community attitudes. Esperance has long experienced the ups and downs of a sawmilling industry that has been instrumental in shaping the nature of the community itself. Such an historical relationship is absent in Spring Bay and this may help explain differences in both attitude and perception of the pulpwood industry between these two communities.

4.3 REGIONAL DEVELOPMENT AND EMPLOYMENT

Section 4.2 outlined the contrasting historical development of Esperance and Spring Bay. This approach was adopted in order to help understand differing community attitudes to, and perceptions of the changes brought about by the pulpwood industry[†] in each area. This section quantitatively examines those changes focussing on economic activity and employment trends. The examination is designed to portray the direct and flow-on effects of woodpulping on the municipalities where the industries are located. It is assumed that many of these effects are quite localized. However, they are not completely confined to the municipalities under scrutiny. For example, over half of the trucking contractors, prime contractors, and bushmen serving TPFH live outside the Spring Bay municipality. Their geographical distribution extends over much of the East Coast. The situation in Esperance appears different with most contractors living in the municipality.

As a general observation, the pulpwood industry has noticeably influenced the economy of Spring Bay, while the impact in Esperance is more difficult to discern. To indicate this, trends in employment are traced from the commencement of industrial wood processing by the respective pulpwood companies. The interaction between different sectors of each municipal economy and the pulpwood industry is also examined. This essentially numerical information is supplemented by local comment on economic and employment changes perceived to be related to forestry in each municipality. Features of the survey samples which illustrate the impact of woodpulping on regional development are also included.

4.3.1 Employment Trends

The employment structures of Esperance and Spring Bay are typical

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[†] When discussing both areas together, the more general term 'pulpwood industry' will be used to encompass the operations of APM at Port Huon in Esperance as well as the woodchip operations of TPFH in Spring Bay.

of rural areas without any major urban centres. This is reflected in Table 4.1 which provides a detailed breakdown of employment trends within industry sectors in each municipality. The table contents should be used with caution and generally only in terms of broad comparisons. This is largely due to definition changes following the adoption of the Australian Standard Industrial Classification in 1968 by the Australian Bureau of Statistics. Although suffering an overall decline, the agricultural sector has continued to be the predominant employer in each area. Manufacturing has played a secondary role while the wholesale and retail trade has fluctuated in Esperance and increased steadily in Spring Bay between 1971-1981. With regard to the service industries, each municipality is a microcosm of similar trends occurring within Western industrialized nations. There has been growth in service-related employment and a relative decline in other sectors.

It has been noted, and is partly reflected in Table 4.1, that the range of occupations in Esperance is restricted in comparison to Australia as a whole, and indeed to other municipalities in the Huon district (Behrens *et al.* 1978). Broadly speaking, there are relatively few clerical or skilled employment opportunities and a disproportionate number of semi-skilled and unskilled manual jobs available. The occupational structure of Spring Bay reveals a similar situation although the proportion of the workforce in semi or unskilled occupations, particularly in primary industry, is lower. If employment opportunities are restricted to a few primary industries, then fluctuations in these industries will be deeply felt in the communities under examination.

Table 4.2 shows that the Esperance labour force has increased by only 2% in the period 1954-1981. Corresponding figures for Spring Bay show an increase of over 130% or more than a doubling of the labour force. Esperance has maintained a static labour force largely through the opposing forces of outmigration, resulting in population loss, and

TABLE 4.1

Employment Population by Industry Group: Esperance and Spring Bay 1954 - 1981[a]

INDUSTRY	ESPERANCE									SPRING BAY								
	1954			1961			1966			1954			1961			1966		
	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P
PRIMARY PRODUCTION																		
Fishing, Hunting etc.	22		22	37		37	44	2	46	29		29	46		46	54	4	58
Agriculture, Mixed-Farming	405	12	417	397	16	413				63	2	65	58	5	63			
Grazing	3		3	3		3	371	35	406	87	2	89	72	4	76	126	11	137
Dairying	6		6	8		8						0			0			
Forestry	72		72	70		70	178	4	182	9		9	4		4	5		5
TOTAL	508	12	520	515	16	531	593	41	634	188	4	192	180	9	189	185	15	200
MINING AND QUARRYING	37	1	38	10		10	23		23			0			0	2		2
MANUFACTURING																		
Founding, Engineering	2		2	2		2	2	-	2			0	1		1	1		1
Ships, Vehicles				1		1	5	1	6	1		1	4		4	1		1
Textiles and Fibrous materials			0			0		-	0			0			0			0
Clothing, Knitted Clothes, Boots	1	2	3	1	1	2			0			0			0			0
Food, Drink, Tobacco	46	39	85	54	13	67	28	44	72	9	1	10	9		9	7		7
Sawmilling, Wood Products	113		113	125		125		n.p.		13		13	18		18		n.p.	
Paper, Printing	1	1	2	5		5	78	2	80			0			0			0
TOTAL	175	45	220	205	14	219†	239	50	289†	28	1	29	32		32†	57	3	60†
ELECTRICITY, GAS, WATER			0			0			0	2		2	1		1	1		1
BUILDING AND CONSTRUCTION	69		69	101	1	102	47	1	48	31		31	77		77	41	1	42
TRANSPORT AND STORAGE																		
Shipping	4		4	8		8	12		12	1		1			0			0
Road Transport, Storage		n.p.		48	2	50	77	9	86		n.p.		11		11	15	1	16
TOTAL	51	2	53	56	2	58	93	10	103*	15		15	11		11	15	1	16*
COMMUNICATION	15	11	26	16	12	28	24	18	42	3	3	6	4	5	9	7	2	9
FINANCE AND PROPERTY	4		4	6	1	7	9	2	11			0	2		2	1	1	2
COMMERCE	56	21	77	54	31	85	48	42	90	25	5	30	16	11	27	15	16	31
PUBLIC AUTHORITY, PROFESSIONAL	48	38	86	53	38	91Θ	57	48	105Θ	14	6	20	12	11	23Θ	13	15	28Θ
AMUSEMENT, HOTELS, CLUBS	20	20	40	17	33	50	17	33	50	10	12	22	11	13	24	12	15	27
OTHER	21	4	25	21	9	30	16	26	42	5	1	6	7	3	10	5	6	11

TABLE 4.1 (continued)

INDUSTRY	ESPERANCE									SPRING BAY								
	1971			1976			1981			1971			1076			1981		
	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P
AGRICULTURE																		
Agriculture		n.a.		166	45	211	152	54	206		n.a.		61	16	78	64	13	77
Forestry, Timber		n.a.		70	4	74	139	14	153		n.a.		58	8	66	84	7	91
Fishing, Hunting		n.a.		36	4	40					n.a.		37	4	41			
Undefined		n.a.				0					n.a.				0			
TOTAL	445	19	464	272	53	325	291	68	359	147	9	156	156	28	185	148	20	168
MINING	23		23	6	0	6	8	2	10	1	0	1			0			0
MANUFACTURING																		
Food, Drink, Tobacco		n.a.	16	16	6	23	29	27	56		n.a.				0	7	14	21
Textiles, Clothing		n.a.		0	2	2			0		n.a.				0			0
Wood, Furniture		n.a.		58	2	60	55	0	55		n.a.		122	6	128	108	5	113
Metal Products, Machinery		n.a.		12	0	12	10	0	10		n.a.		4	0	4	8	2	10
Other + Undefined		n.a.		83	2	85	69	4	73		n.a.				0	8	0	8
TOTAL	243	37	280	170	12	182	163	31	194	115	8	123	126	6	131	131	21	152
ELECTRICITY, GAS, WATER			0	1	0	1			0	6	0	6	10	0	10	9	0	9
CONSTRUCTION	179	1	180	65	2	67	24	2	26	77	0	77	42	4	47	43	0	43
WHOLESALE, RETAIL TRADE																		
Wholesale & Undefined		n.a.		32	10	42	17	4	21		n.a.		22	12	35	19	16	35
Retail		n.a.		49	31	80	39	45	84		n.a.		15	21	36	23	35	58
TOTAL	55	50	105	81	41	122	56	49	105	25	28	53	38	33	71	42	51	93
TRANSPORT AND STORAGE																		
Road Transport		n.a.		40	2	42	37	6	43		n.a.		16	8	24	24	6	30
TOTAL	63	5	68	51	2	54	57	6	63	25	2	27	16	8	24	28	10	38
COMMUNICATIONS, FINANCE, ADMIN.	57	33	90	31	11	44	37	16	53	14	10	24	24	13	39	27	17	44
COMMUNITY SERVICES	18	62	80	31	89	120	34	75	109	6	10	16	10	39	49	26	40	66
ENTERTAINMENT, RECREATION																		
Restaurants, Hotels, Clubs		n.a.		17	4	21	15	14	29		n.a.		11	15	25	26	32	58
TOTAL	11	11	22	21	4	25	23	18	41	19	14	33	13	17	29	26	32	58
OTHER	22	9	31	53	53	106	51	43	94	15	7	22	14	44	58	41	45	86

AUSTRALIAN BUREAU OF STATISTICS; 1954-1981; *Australian Bureau of Statistics Census of Population and Housing - Characteristics of the Population and Dwellings in Local Government Areas, Tasmania, 1954-1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

Includes Rail and Air Transport

Includes Other

Includes Community and Business Services

TABLE 4.2

Labour force and labour force participation rates for Esperance and Spring Bay, 1954-1981[a]

Labour force	1954		1961		1966		1971		1976		1981	
	Esp	S.B.	Esp	S.B.	Esp	S.B.	Esp	S.B.	Esp	S.B.	Esp	S.B.
Males	1004	321	1054	353	1166	354	1132	456	844	463	823	556
Females	154	32	157	50	271	75	234	90	296	198	352	261
Persons	1158	353	1211	403	1437	429	1366	546	1140	662	1175	871
Labour force Participation Rate %	36.2	33.7	35.2	34.9	38.4	35.6	38.7	36.8	35.8	37.4	38.6	43.3
State labour force Participation Rate %	38.3		37.4		39.7		39.3		42.4		44.1	
Female Participation Rate %	10.1	6.6	9.6	9.4	15.4	13.4	14.6	13.6	20.0	23.4	24.4	28.6
State Female Participation Rate %	16.0		17.1		22.1		23.3		29		31.7	

[a] AUSTRALIAN BUREAU OF STATISTICS, 1954-1981; *Australian Bureau of Statistics Census of Population and Housing - Characteristics of the Population and Dwellings in Local Government Areas, Tasmania, 1954-1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

a significant increase in the number of unemployed staying in the municipality. The latter trend is also evident in Spring Bay but, unlike Esperance, increased numbers in the labour force have been accompanied by population growth, not decline (see sub-section 4.4.1).

Fluctuations in the total labour force have been closely allied with establishment of a pulpwood industry in each municipality. Between the years 1961-1966, the Esperance labour force grew by 19%. This period co-incides with the construction phase and initial operation of APM's semi-chemical pulp mill. The previous intercensal period witnessed a marginal increase in the labour force while, after 1966, there were major downturns, particularly between 1971-1976. The pulpwood industry in Spring Bay was fully operational prior to the 1977 census with the first shipment of woodchips leaving in April of that year (Jones 1975). Thus, between the years 1966-1971, the Spring Bay labour force increased by 27% compared to an increase of 7% in the previous five years. The high level of labour force growth was maintained at least until 1981, whether as a direct result of the pulpwood industry or not. It is clear from Table 4.3 that unemployed people in Spring Bay have constituted an increasing proportion of the labour force, particularly since the late 1970s. In the case of Esperance, unemployed people have made up a significant proportion of the labour force since the early 1970s.

Possible explanations of labour force trends may be found in examining male and female labour force changes separately. Trends in the male component of the Esperance labour force indicate an overall decline of 18% between 1954-81 (Table 4.2). The only increase occurred in the intercensal period 1961-66. By contrast, between 1954-1981, the male labour force of Spring Bay continually expanded by an overall figure of 73%, with major expansion occurring between 1966-1971. Table 4.1 provides an explanation for these trends. At least four sectors of the

TABLE 4.3

Recent trends in unemployment in Esperance and Spring Bay[a]

Year	Number		% of Workforce		% of Population	
	ESP	SB	ESP	SB	ESP	SB
1971	23	8	1.6	1.5	.6	.7
1976	89	21	7.8	3.2	2.8	1.2
1981	117	59	10.0	7.2	3.8	3.1

[a] AUSTRALIAN BUREAU OF STATISTICS, 1971-1981; *Australian Bureau of Statistics Census of Population and Housing-Characteristics of the Population and Dwellings in Local Government Areas, Tasmania 1971-1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

Esperance economy underwent significant fluctuations in the period 1961-66. All of these were male-orientated and related to the establishment of APM's pulp mill. Employment in the forestry sector (covering the harvesting of timber actually in the forest) rose from 70 to 182. Expansion in the road transport and storage sector from 50 in 1961 to 86 in 1966 can be attributed, at least partly, to the number of log hauliers required to cart pulpwood. The 71 mill employees, excluding staff (personal communication, J. Smith Mill Manager 1981), would explain the equivalent increase of those employed in the paper and printing sector. The fourth sector connected with the pulp industry was building and construction. Unlike the other sectors, this industry experienced a decline in employment of over 50%. This was largely due to the completion of the mill itself and approximately 45 APM staff and employee houses by the mid 1960s. Across all four sectors, approximately 200 male-orientated jobs may have been created in the period covering the establishment of APM's operations at Port Huon.

Spring Bay labour force figures show an increase of 29% in male employment from 1966-71. The intercensal periods prior to and after these years show the male labour force to have remained quite static.

Once again, the increase can be attributed largely to the woodchip industry. At that time, other prominent industries were either stable or experiencing a gradual downturn (closure of the Alginates and Fish Meal factories as well as Rostrevor Estate had not yet occurred). Changes in Australian Bureau of Statistics' classifications and lack of specific information for 1971 obscure trends within specific sectors between 1966-71. Within the primary industry sector, a decline of 39% in the period 1966-76 appears to have been offset by an increase of approximately 60 jobs within the forestry sector. A certain percentage of farm labourers may have transferred from farming to the woodchip industry; pre-survey interviews conducted in 1981 revealed that graziers often experienced difficulty in keeping their farm hands who were attracted by the improved conditions and better wages associated with the woodchip industry.

In keeping with male employment trends in Esperance, manufacturing employment in Spring Bay doubled between 1966-71, roughly corresponding to the initial number of TPFH mill workers in early 1971. A similar doubling within the building and construction industry co-incided with increased activity associated with a major housing development for TPFH staff and employees. Once this construction phase was over, the industry returned to its pre-woodchip level of activity. It is interesting to note the marginal increase within the road transport sector. In its first year of operation, TPFH engaged a transport network of 56 log trucks to supply the mill. It appears that, at most, only a dozen were domiciled in Spring Bay.

To summarize, approximately 150 permanent male-orientated jobs were initially created by the woodchip industry in Spring Bay. The greater size and population of Esperance and its timber industry background has meant that more direct employment was created by APM in Esperance than by TPFH in Spring Bay. The higher wood volume used by TPFH (about

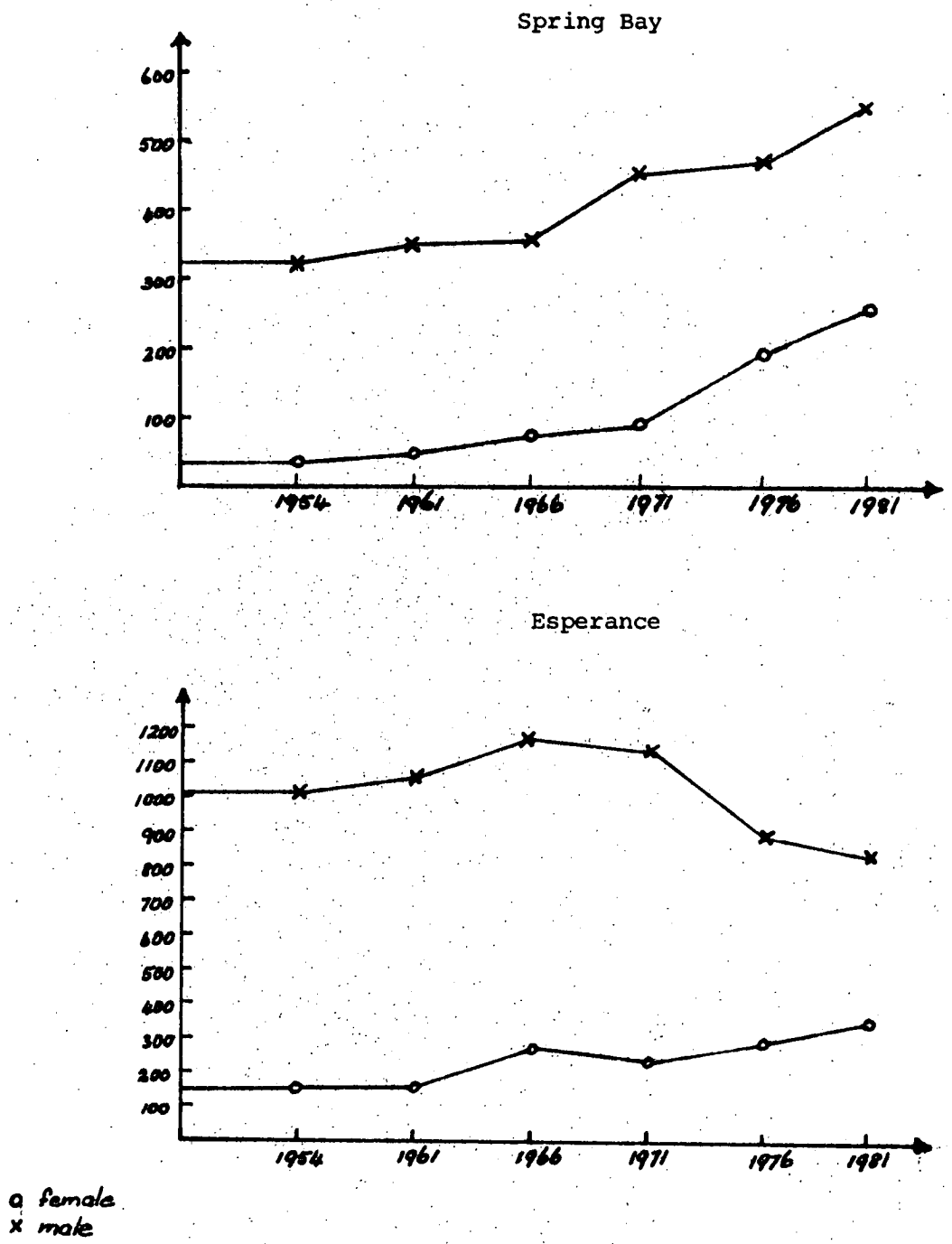
four times that of APM) from its expansive concession and reserve areas has created a network of employment throughout the East Coast and midlands radiating from Triabunna.

Subject to the limitations imposed by available data, trends within the male labour force component of the pulpwood industry following the initial establishment phase (post 1966 in Esperance and post 1976 in Spring Bay) indicate an overall decline in Esperance and relative stability in Spring Bay. In both areas, the number of mill employees has remained quite stable (ignoring temporary cutbacks) while, in Esperance, decline in the transport and forestry sectors has been in the vicinity of 30-40%.

A common development in both Spring Bay and Esperance has been a sharp increase in the overall number of females in the labour force. In gross terms, the Spring Bay female labour force has increased sevenfold during the years 1954-81, while that of Esperance has more than doubled (Table 4.2). Figure 4.3 shows the periods of major expansion were between 1971-76 for Spring Bay and 1961-66 in Esperance. In other words, respective increases of 120% and 73% in female employment occurred during the same intercensal period in which the pulpwood industry began operations. However, the causal role played by the pulpwood industry in these large increases in female employment is less obvious than in the case of the increase in the number of male employees, and consequently, was difficult to quantify. For example, major expansion occurred in the agricultural sector in both communities, a trend that is unlikely to be related to the pulpwood industry. The problem of inter-relationship is further compounded by the fact that, despite a massive decline in population and in the male labour force in Esperance from 1971 to 1976, the female labour force actually increased by 27%. The increase appears to have occurred in precisely the same sectors as those in Spring Bay during the same period (Table 4.1). This raises

FIGURE 4.3

Male and female labour force trends in Esperance and Spring Bay: 1954 - 1981[a]



[a] Data derived from Table 4.2.

the question as to what extent increases in female employment, particularly in Esperance, merely reflect similar trends occurring right throughout Australia, which show increased female participation in the labour force, particularly within the 'service' industries. On a regional basis these industries correlate closely with population levels; it is evident from Table 4.1 that, in the decade 1971-81, Spring Bay experienced a dramatic increase in employment within the retail trade and community services. In the same decade, population growth in Spring Bay has been closely linked with the pulpwood industry (see subsection 4.4.1) and, in this way, must partly explain growth in female employment. With a fluctuating population throughout the 1960s, these correlations are obscured in Esperance. In this community, the pulpwood industry may have acted more as a brake to population decline than as a direct contributor to increased female employment.

A clear indication of the differential impact of woodpulping on the female labour force in Spring Bay and Esperance can be found when comparing increases in female participation rates at the State and regional level (Table 4.2). For Esperance, rises in female participation rates between 1961-66 and 1971-76 (5.8% and 5.4% respectively) were paralleled on a statewide basis in the same years (5% and 5.7%). From 1971-76, female labour force participation in Spring Bay rose by 9.8%, almost double that of the statewide increase. During this period, in which Spring Bay's population grew rapidly, there was an overall decline in the fishing and farming industries; these trends suggest a major proportion of the increased female labour force participation must be attributable to the woodchip industry.

A common factor in both areas has been the lower number of females in the labour force relative to the statewide situation. At times, the levels have been less than half that of the State; overall, however, the trend has been towards comparability with the rest of the State (Table

4.2). Low levels of female participation in the labour force, particularly in the past, are a reflection of the lack of employment opportunities for females in the male-orientated primary industry sector. The situation is changing, however, as more jobs are created within the 'service' industries and with increased participation by females in agriculture over the last decade.

Examination of female labour force participation rates, fluctuations in various employment sectors, and population change, can only provide a crude approximation of the actual number of female jobs connected with the pulpwood industry. Close examination of statistics gathered during the early days of the industry suggest that 35-40 additional female jobs are connected with APM's operations at Port Huon. For Spring Bay, the number was roughly double that of Esperance with approximately 75-80 additional jobs being created.

One final comment on participation rates should be made; it must be remembered that trends in the labour force do not necessarily reflect actual employment changes. As a measure of employment growth, the labour force and labour force participation rates have been held artifically high by high unemployment rates particularly over recent years. Throughout the 1960s, the unemployment rate in Esperance averaged around 2%; by 1981, 10% of the labour force was unemployed (see Table 4.3). From 1971-81, Spring Bay experienced a similar increase as unemployment grew from 1.5% to 7.2%. The lack of employment prospects elsewhere has meant that fewer people are prepared to leave the district and the unemployed have become a significant group within each community.

The discussion so far has been limited to the relationship between the advent of woodpulping and employment levels. But how does each community perceive the significance of the pulpwood industry in terms of employment and prosperity? These, and other questions, were gauged in a social survey carried out in the Spring Bay and Esperance municipal-

ities from November to December 1981. An interview questionnaire was given to a total of 233 people randomly selected from each municipal population (117 in Esperance and 116 in Spring Bay). The population had been previously stratified into four broadly-based employment groups. A similar number of people were then selected from each group. The questionnaire was designed to reflect people's feelings and attitudes to a number of factors ranging from the community itself to attitudes towards the pulpwood industry (for a more detailed discussion on the survey see Section 5.1).

Information from the survey found that both communities perceived the pulpwood industry to be most important for employment and overall prosperity in each region (Table 4.4). However, whereas opinion in Spring Bay was virtually unanimous on this point, in Esperance only a little over half the sample was of this view. Esperance people saw fishing and orcharding as also making important economic contributions to the municipality, a reflection of the current and historical role of both industries, particularly orcharding, and the size and geography of the region. The influence of woodpulping was most strongly recognized in the respective mill towns. Since Esperance is much larger than Spring Bay and many more people live outside Geeveston, the role of the pulp mill was not accorded overwhelming importance as was the woodchip mill in Spring Bay.

Although the pulpwood industry ranked as the most important source of employment and prosperity in each area, it was viewed as having predominantly a static or diminishing effect in the future. The perceived current importance of the pulpwood industry and doubts over its future must lead to insecurity and create some anxiety within each community (see Figure 5.4). Any level of anxiety was proven justified in Esperance in October 1982 when APM quite suddenly announced a two year closure of its Port Huon mill.

TABLE 4.4

Perception of local industry in Esperance and Spring Bay[a]

(a) Industry most important for employment

	Esperance		Spring Bay	
	No.	%	No.	%
Pulpwood	64	54.7	105	90.5
Farming	35	29.9	4	3.4
Fishing	15	12.8	7	6.0
Tourism	-	-	-	-
Sawmilling	2	1.7	-	-
No response	1	0.9	-	-

(b) Industry most important for overall prosperity

	Esperance		Spring Bay	
	No.	%	No.	%
Pulpwood	65	55.6	98	84.5
Farming	30	25.6	10	8.6
Fishing	17	14.5	5	4.3
Tourism	2	1.7	3	2.6
Sawmilling	2	1.7	-	-
No response	-	-	-	-

[a] Un-weighted results of stratified sample.

4.3.2 Regional Development

In order to trace employment trends and economic changes more accurately, this sub-section examines in detail the relationship between the pulpwood industry and other sectors of each local economy. Similar work focussing on the regional impact of intensive forestry (Ferguson

1973; Greig 1979a) has often involved derivation of regional multipliers, a practice that is not devoid of major problems (see Chapter 2). No such derivation or use of multipliers will be attempted here, although application of the multiplier concept in Esperance by the Forestry Commission will be discussed.

Analysis will be based on information gathered primarily from local interviews of business people, farmers and council employees. This is supplemented by statistical data published by the Australian Bureau of Statistics. It is hoped that this approach will provide a more quantitative insight into the relationship between woodpulping and other regional economic sectors than the straightforward application of economic multipliers. The industries chosen for examination are those considered most likely to be effected by woodpulping: the agricultural sector, retail, commercial and manufacturing businesses, and, finally, the tourist trade.

(a) Effects on Farming

As noted in Section 4.2, the Esperance community is significantly dependent on an apple and pear industry that began as far back as the mid-nineteenth century. This traditional dependence has led to major socio-economic problems over the last 20 years as the pome fruit industry in Tasmania went into recession (for a study of these trends and their impact on the Huon Valley, see Cuthbertson *et al.* 1974). Between 1955-80, the number of rural holdings in Esperance declined by 73% (Table 4.5), corresponding to a similar decline in the number of orchards in the district between 1966-80 (Australian Bureau of Statistics 1980). Many of these orchards would have been grubbed out under the Fruitgrowing Reconstruction Scheme of the early 1970s.

Although APM harvest pulpwood from private land, the small, intensively farmed orchards of Esperance have effectively ruled out any major

interaction with the pulpwood industry. The private forest resource is quite limited. The private forests of the East Coast are far more extensive and are much sought after by the woodchip industry.

Spring Bay has experienced a slightly lower decline in rural holdings than Esperance; here, there has been a 55% drop from 96 in 1955 to 43 in 1980 (Table 4.5). The decrease has been gradual and is likely to represent the buying up of smaller properties by larger landholders (personal communication, C. Seccombe Department of Agriculture 1982). The decline is also partly the result of a 1976 change in Australian Bureau of Statistics' Classifications whereby any rural holding with an annual value of agricultural production less than $1500 is excluded from the census. This change is unlikely to have much impact as the properties involved are generally both large and commercial enterprises. As Spring Bay is a grazing district, sheep production figures provide a better guide to agricultural prosperity. The total number of sheep in the municipality grew steadily from 71 000 in 1954 to 118 000 in 1970, a 66% increase (Australian Bureau of Statistics 1955-1980). Since 1970, however, farms have experienced difficulties with drought and pests, resulting in a 21% decline in sheep production (Australian Bureau of Statistics, 1971-1981). Interaction between farming and woodchipping is connected with this area of livestock production. Many farmers have seized the opportunity to have their forests woodchipped and cleared for pasture, mostly for sheep grazing.

Two companies, TPFH and Forest Resources, are involved in cutting private forests for woodchips in Spring Bay. Farmers enter into agreements with either company for the removal of wood and, in some instances, the regeneration of forests. The land cleared is often of marginal utility, being either hilly or stoney areas. In a standard agreement TPFH would buy timber from a landowner over a 20 year period. An initial 30% deposit is paid plus interest at current rates on the value

TABLE 4.5

Trends in industrial indicators in Esperance and Spring Bay, 1955-1981[a]

(a) Spring Bay

Category	Year					
	1956	1963	1967	1972	1975	1980
Number of rural holdings	96	85	79	65	53	43(1981)†
Area of sown pasture (ha)*	4019	1415	8550	11 043	17 478	13 798(1981)
Number of factories	8	8	9	n.p.	n.p.	n.p.
Number of manufacturing establishments	n.p.	n.p.	n.p.	4(1970)	6(1974)	4
Number of retail establishments	16(1957)	16	16(1969)	16	21(1974)	17
Number of sawmills & plywood mills	n.a.	3	4	2	2	3

(b) Esperance

Number of rural holdings	355	314	278	239	204	97(1981)†
Apple production (million bushels)	1.07	1.09	1.19	1.33	1.25	0.78
Number of factories	38	46	33	n.p.	n.p.	n.p.
Number of manufacturing establishments	n.p.	n.p.	n.p.	18(1970)	18(1974)	18
Number of retail establishments	34(1957)	34	40(1969)	39	33(1974)	31
Number of sawmills & plywood mills	31	29	20	19	14	9

[a] AUSTRALIAN BUREAU OF STATISTICS, 1957-1979; *Compendium of Local Government Area Statistics Tasmania, 1957-1979;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1981; *Census of Manufacturing Establishments, Details of Operations and Small Area Statistics Tasmania, 1979-80;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1981; *Agricultural Industry Tasmania, 1979-80;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

* Prior to the early 1970s this category was subject to fluctuations caused by problems with definition.

† Sharp downturns partly caused by re-classification of rural holdings to exclude non-commercial operations.

of the remainder. The company pays the additional 70% when the timber is required. As an incentive, higher stumpage rates are paid if the owner decides to restock his land with forest (personal communication, N. Vance Retired Forest Manager for TPFH 1981). Forest Resources pays up to 50% of the regeneration costs, often with a further 30% being supplied by the Forestry Commission (personal communication, P. Shepherd, Forest Resources 1981). Nonetheless, of the farmers interviewed during the questionnaire survey, none had become involved in reforestation schemes, confirming the results of other research (Davies 1982). Sheep grazing was clearly perceived as more economically viable, providing a quicker, greater and more reliable return than tree farming. One estimate put the annual return from grazing at $36 per hectare. None of the farmers interviewed expected to make any profit from timber royalties. The basic aim was to balance the amount obtained through royalties with the costs associated with conversion to pasture (costs include burning, ploughing, and sowing but usually not fencing). In some cases, complaints were made over the amount of residue left behind that had to be tidied up by the landowners. Some farmers were concerned with the lack of control and supervision over contractors, complaining that this led to the pulping of sawlogs and erosion problems.

In short, woodchipping has provided a non-profitable (and sometimes unreliable) means by which farmers can increase their pasture land. As a result, between 1972 and 1975, the total area of sown pasture in Spring Bay increased from 11 043 to 17 478 hectares, an average annual increase of 15% since establishment of the woodchip industry compared with 6% during the five years prior to that event.

Although decline in sheep production has been attributed largely to drought conditions, from 1975-80, the area of sown pastures in Spring Bay decreased by 21%. (Such fluctuations could be the result of problems in the definition of pasture land adopted by the Australian

Bureau of Statistics.) It has been suggested that only 25-30% of land cleared for woodchips in Spring Bay was being maintained as viable, good quality pasture land (personal communication, C. Seccombe Department of Agriculture 1982). The rest, being of marginal value, may have initially been aerially sown then, after a short period, allowed to degenerate to scrubland, and thus eventually disregarded as sown pasture. This is a reasonable explanation if it is assumed that most areas of potentially high quality pastureland would have been cleared well before TPFH began operations.

From a long-term perspective, only those landowners who established permanent pastureland (25-30%) will profit from having their forests cleared for woodchips. In the short-term, land cleared without any further development may have provided some financial gain. Apart from these two categories, a significant number of farmers would have either broken even or benefited little from woodchipping.

(b) Effects on the Retail-Commercial and Manufacturing Sectors

Generally, it would appear that the flow-on economic benefits of the pulpwood industry have been quite localized in their effects. In Spring Bay, those benefits have been concentrated around Triabunna, while Orford continues to remain a holiday/retirement area. Esperance is in a similar position, with Geeveston fulfilling the same role as Triabunna while, further south, the woodpulp industry is of far less significance. This localization of effects is particularly evident in the retail-commercial and manufacturing sectors. Both these sectors have expanded in Geeveston and Triabunna, while it appears that, throughout each municipality, there has been an overall downturn. From a community perspective, the increased number of retail outlets in each mill town represented a visible example of the flow-on benefits of the

pulpwood industry. Such sentiments were expressed widely by residents of Geeveston and Triabunna when they were surveyed concerning the relative advantages to the community flowing from the pulpwood industry.

It is difficult to accurately determine from available information the degree of localized expansion attributable to the pulpwood industry. In the twenty year period, 1955-75, the Australian Bureau of Statistics' collection criteria for manufacturing establishments have undergone at least three changes, the basic thrust being to eliminate marginal establishments in order to provide more reliable information on trends within the manufacturing sector. Similar alterations have also been made to the definition of a retail establishment. Fortunately, these changes do not rule out comparability, largely because they did not occur at a crucial time in the period under examination. However, any interpretation must be viewed with caution.

Table 4.5 depicts similar trends occurring in Spring Bay to those occurring earlier in Esperance. In the first few years following establishment of the pulpwood industry, the number of manufacturing establishments in Esperance rose from 38 to 46 while, in Spring Bay, the increase was from 4 to 6. Within a few more years the trend had reversed and the sector returned to pre-pulpwood levels. Similarly, in retail trade, an initial period of expansion was followed by a slow contraction to previous levels. In the long term, woodpulping may not have facilitated growth in the retail and manufacturing sectors within each municipality *as a whole* however; as with employment levels, the industry has acted as a buffer to further decline in Geeveston and contributed to both sectors in Triabunna.

In each area, there are some establishments which are significantly dependent on the custom of pulpwood industry employees or the mills themselves. Most other establishments are at least partially dependent on such custom. Information gathered through correspondence and inter-

views indicate retail-commercial outlets such as supermarkets (one recently established in Triabunna), butchers, hardware, and electrical stores, service stations, some hotels and banks, all rely to a varying degree on the custom of those in the forest industry. There are approximately a dozen businesses in this category in both Triabunna and Geeveston. Some proprietors voiced concern over any major slump in the pulpwood industry. Strong financial links between the banks and contractors place the banks in a similar situation. A branch of the Commercial Bank of Australia in Geeveston is involved with approximately twenty operations and is the main source of leasing arrangements.

Businesses catering for specific requirements of the forest industries are likely to be totally dependent on them. Two small engineering operations in Geeveston and one larger firm in Triabunna service the log hauling industry. In order to cater for the demand created by bulldozers, skidders and log trucks for diesel fuel, a number of fuel depots (three in Spring Bay) depend almost entirely on the pulpwood industry. Each municipal centre has a saw outlet for the requirements of those working in the bush (in Esperance, and to a lesser extent, Spring Bay, this would include sawmill employees.) Most locally dependent industries are quite small, often only one or two-person operations. In comparison with retail outlets partially dependent on woodpulping, these smaller businesses would appear to have a negligible effect on the local economy.

In sum, the impact of the pulpwood industry on the retail-commercial and manufacturing sectors appears to be quite localized in its effects. Up to a dozen establishments are at least partly dependent on the continued custom of those in the forestry sector. Growth has occurred mostly in Triabunna. To a much smaller extent, this has also occurred in Geeveston but, as in Spring Bay, the dependency does not seem to flow throughout the whole of each municipality.

(c) Effects on Tourism

With regard to the tourist industry, both Esperance and Spring Bay have developed along very similar lines.

Orford has long been recognized as the holiday resort and retirement centre of Spring Bay. This is reflected in the increase in unoccupied dwellings recorded in the municipality (used as an indicator of the magnitude of holiday accommodation). Between 1954 and 1976 the total number of dwellings increased from 380 to 813, while the number of dwellings unoccupied at the time of census increased from 89 to 281 or from 23.4% to 34.5% of total municipal dwellings (Australian Bureau of Statistics 1954-76). This trend has continued with all the completed buildings in 1980 being holiday homes in the Orford district (personal communication, D. Laird Council Clerk Spring Bay 1981).

The localization and growth of recreational development in Spring Bay has been closely paralleled in Esperance. The southern village of Southport has witnessed considerable growth in the number of holiday homes built in the district. Once again, between 1954 and 1976 the proportion of unoccupied to total dwellings in the municipality increased from 5% to 31%. A detailed list of holiday-home owners from Esperance indicates approximately a third are local residents. This observation, plus the short duration of most holidays indicates holiday-home owners are unlikely to make a significant contribution to the local economy of Esperance. The continued growth in the number of unoccupied dwellings in both communities suggests no major conflict has yet developed between the pulpwood industry and those seeking a holiday in each area.

The major tourist development in Spring Bay was the gazettal of Maria Island as a National Park in 1975. Progressive restoration of a convict and old industrial settlement, and the attraction of bush walking, have seen the visitation rate increase from 6288 in 1974-75 (Tasmania, National Parks and Wildlife Service 1976) to 30 735 in 198-81 (personal

communication, R. Davies National Parks and Wildlife Service 1982). A similar and relatively stable number of visitors has visited the Hastings Caves National Park in southern Esperance to enjoy the thermal pool and underground limestone caves (Tasmania, National Parks and Wildlife Service 1981). Although visitation rates for both National Parks have been roughly equivalent, development of a major tourist industry has only really occurred in Spring Bay. Location and climate have combined to create a number of tourist-related establishments that partially depend on the custom of those associated with the woodchip industry; this is particularly so in the off season.

There are four establishments in Spring Bay with motel accommodation. Three of these depend almost entirely on tourism and residents of Orford. The Tandara hotel-motel in Triabunna employs between 16 to 24 people depending on the season. Approximately 40% of the hotel business relies on the custom of those associated with the woodchip industry (personal communication, J. Petterwood Tandara Manager 1981). Patronage of the motel accommodation relies to a similar extent, on the same group. (Two motel owners expressed concern over the noise, road damage, and danger caused by log trucks; these sentiments were also prevalent in the survey results, but it would be extremely difficult to gauge the possible effects on the tourist trade.) Other tourist-related businesses partially dependent on the increased population include a small number of fast-food outlets.

In contrast to the tourist situation in Spring Bay, tourism associated with Hastings Caves depends on day trippers. Consequently, there has been little, if any, tourist development in Esperance. Two hotels, one in Dover, the other opposite the pulp mill at Port Huon, rely largely on local custom, the latter being closely associated with APM employees and contractors.

The under-development of tourism in Esperance was reflected in people's opinion of its potential; 68% of Esperance people surveyed believed tourism to have the potential for further expansion (Table 4.6). A similar feeling prevailed in Spring Bay. This level of optimism was considerably higher than people's confidence in other local industries (Table 4.6).

TABLE 4.6

Survey opinion of further expansion in industries: Spring Bay and Esperance[a]

Industry	Possibility for further expansion - % of sample	
	Spring Bay	Esperance
Farming	13	11
Pulpwood	23	19
Fishing	38	37
Tourism	68	68
Sawmilling	12	10

[a] Un-weighted results of stratified sample.

Overall, there would appear to be little interaction between the pulpwood industry and tourism. Only those tourist-orientated establishments in the respective mill towns rely to any significant degree on the custom of woodchip employees. Although fears were expressed over the possible adverse impact of log hauling on the tourist trade, no evidence for this relationship was forthcoming.

(d) Effects on Forestry

A significant problem associated with employment in forestry and its connection with regional growth is the dispersed nature of the employment itself. It has already been noted that employment benefits connected with TPFH are spread over much of the East Coast. These

benefits have been discussed in Section 3.2 and sub-section 4.3.1; however, some additional comments should be made. Approximately 160 forestry-related jobs were created in Spring Bay as a result of the woodchip industry with a similar number being generated outside the municipality. The same situation does not appear to apply in the case of Esperance. The location of the municipality, the close proximity of the pulpwood resource and the relatively small size of APM's operations, have combined to confine much of the forestry employment benefits within the municipality. Estimates of the total employment vary quite considerably; a reasonable estimate would be 270 (70 Forestry Commission employees and 100 for both logging contractors and mill employees) (personal communication, J. Smith APM Mill Manager, and P. Smith Assistant District Forester 1981). Approximately 80% of Forestry Commission employees live in Esperance (personal communication, P. Smith Assistant District Forester 1981). If an equivalent percentage can be assumed for other forestry sectors, then just over 200 forestry-related jobs are connected with APM's operations. This figure closely correlates with previous estimates found in sub-section 4.3.1.

The Forestry Commission has estimated the number of people in Esperance dependent on forestry employment for their livelihood to be 900 (Tasmania, Forestry Commission 1979). This figure was achieved by applying a Type II multiplier of 2.5 to the total number of forestry-related jobs in the area (for details of multipliers, see Chapter 2). The basic problem is the application of a multiplier calculated on a statewide level and applied on a specific regional basis. In effect, this ignores the pecularities of the industry involved and its particular location. It has already been suggested that only 80% of those employed in the forestry sector in Esperance actually live in the municipality. Other sorts of leakages are also bound to occur. Examples include people making purchases and having maintenance carried out outside the municipality.

4.3.3 Summary

In one sense the occupational structure of the two communities under examination ideally suited the requirements of the pulpwood industry. The agricultural background of the Esperance economy, and to a lesser extent, Spring Bay, meant that locally available labour was largely semi-skilled and unskilled. In the case of Esperance, a long history of timber involvement and the concurrent collapse of the 'box' sawmilling industry provided a ready workforce of forestry and logging expertise for the, then, recently established pulpwood industry. On the other hand the lack of forest industry skills in Spring Bay meant that many forestry and logging workers moved into the municipality from outside. The disproportionate number of semi-skilled and unskilled labourers in both communities also meant that most management and technical expertise came from elsewhere. To accommodate this influx, 40-45 houses were constructed by the Housing Department for both APM and TPFH staff employees.

A common factor in both areas was the significant growth in the labour force during the initial establishment period of the pulpwood industry. The expansion was largely confined to the male labour force due to the manual nature of forestry operations. In quantitative terms, an additional 200 male-orientated jobs were created in Esperance, a process involving a high degree of job relocation within the municipality. Despite the much larger consumption of pulpwood by TPFH, only 150 additional jobs were created in Spring Bay, reflecting the more dispersed nature of woodchip employment along the East Coast. There did not appear to have been any appreciable changes in male employment within other sectors of the regional economies. The small increase that may have occurred would be largely confined to those businesses almost totally dependent on the pulpwood industry; these tend to be small in size and

not significant employers.

The relationship between growth in female employment and the pulpwood industry is difficult to quantify. Increases in female employment are obscured by a national trend towards greater female participation in the workforce. This is dramatically portrayed in the rapid growth in female employment in Esperance during the 1970s, increasing by 50% between 1971-81, while in the same period male employment declined by 27%. The substantial expansion in female employment in Spring Bay throughout the 1970s must be a part reflection of similar trends throughout Esperance and Australia, as a whole. A rough estimate of the number of female jobs attributable to the woodchip industry in Spring Bay would be 80-85. Approximately half this number of female jobs can be connected with APM's operations in Esperance. The difference is related to the initial inadequacy of the service industries in Spring Bay to cater for any major population growth. The relatively static number of retail establishments in each municipality as a whole suggests community services and entertainment to be most identifiable sectors of growth in female employment opportunities.

Adding male and female employment together, the above examination of employment trends indicates that approximately 20% of the Esperance workforce is dependent on APM's operations, while a much higher figure of 35-40% is connected with TPFH in Spring Bay. The estimate for Esperance is considerably lower than a similar analysis done by the Forestry Commission (1979) who uncritically applied the multiplier concept to forestry employment in the municipality.

The pulpwood industry has also had an impact on the farming community in Spring Bay. Some landholders have taken the opportunity to have land cleared through long-term agreements with TPFH and Forest Resources (in a few instances, Esperance farmers have sold timber to APM and Forest Resources). In many cases, particularly on smaller properties, the

cleared land is of marginal value and allowed to degenerate to scrub. If no attempts are made to develop this land, the clearing is akin to a mining operation. The 30-40% of land cleared for pasture is carried out at a cost roughly equal to revenue from timber royalties. The small properties and intensive agriculture practised in Esperance effectively rule out significant interaction between private forest owners and pulpwood industries.

In conclusion, the pulpwood industry has quickly established itself as a major employer and significant component of the regional economies under examination. In depressed rural areas the industry has encouraged economic growth; the trend has been more noticeable in Spring Bay where low population levels and stable employment indirectly gave rise to a population influx and growth in the labour force. This increased number of jobs attributable to the woodchip industry in rural areas, represents the major benefit flowing to the Tasmanian community.

4.4 DEMOGRAPHIC AND SOCIAL CHANGES

Changes in employment trends affected by the export woodchip industry in Spring Bay have had a considerable impact on the socio-demographic characteristics of the community. On the other hand, since 1954, changes in the socio-demographic structure of Esperance have been largely caused by factors affecting other rural employment. To verify these general observations, this section examines changes in the total population, sex and age ratios, and migration patterns for both municipalities. Information was obtained by survey (see Chapter 5) and is used to document local perception of the effects of these changes. In order to indicate the representativeness of the survey, the sample populations are compared with those of the total municipal populations. Data has been drawn largely from census figures from 1954 to 1981.

4.4.1 Demographic Trends

Table 4.7 shows population trends from the five census periods between 1954-1981. The Esperance population has declined from a peak during the middle to late 1960s to a 1981 level equal to that of the 1930s depression. As a proportion of the total State population, the municipal population has decreased from 1.04% in 1954 to 0.72% by 1981. By contrast, Spring Bay has experienced population growth in each intercensal period, especially during the early to mid 1970s. Consequently, the percentage of the State's population living in Spring Bay increased from 0.32% in 1954 to 0.47% by 1981.

Table 4.8 provides an insight into these population dynamics and how the changes might relate to the initial impact of the pulpwood industry in both municipalities. Over an eight year period covering the establishment of the pulpwood industry, there are marked differences between the two municipalities. From 1959-66, the Esperance population grew at an average annual rate of 1.2%; simultaneously, natural increase in the local population was at a higher average annual rate of 1.5%. In other words, although the population was expanding it was solely due to natural increase with any inmigration being cancelled by outmigration. In quantitative terms, during the eight year period Esperance experienced a net outmigration of 114 people (Table 4.8). The only year which proved a significant exception to this trend was 1962, the year in which APM began operations. The change, however, was to prove short-lived. Early problems within the pome fruit industry and the decline of 'box' sawmilling strengthened the trend towards further outmigration that was evident prior to the advent of woodpulping.

In marked contrast to Esperance, in the eight year period 1969-76, the Spring Bay population increased at an average annual rate of 4.7%, while the average annual rate of natural increase was considerably lower (1.26%). The increased population, mostly made up of approximately 380

TABLE 4.7

Estimated population of Esperance and Spring Bay and population as a percentage of total State population: 1954-81[a]

(a) Esperance

	1954	1961	1966	1971	1976	1981
Estimated population	3200	3436	3740	3510	3180	3044
% of Total State population	1.04	0.98	1.00	0.90	0.78	0.72

(b) Spring Bay

	1954	1961	1966	1971	1976	1981
Estimated population	1048	1155	1205	1410	1770	1885
% of Total State population	0.34	0.33	0.32	0.36	0.43	0.47

[a] AUSTRALIAN BUREAU OF STATISTICS, 1954-1981; *Australian Bureau of Statistics Census of Population and Housing - Characteristics of the Population and Dwellings in Local Government Areas, Tasmania, 1954-1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

TABLE 4.8

Natural increase in population: Esperance 1959-66 and Spring Bay 1968-76[a]

(a) Esperance 1959-66

Year	Estimated Mean Population†	Births	Deaths	Natural Increase
1959	3427	60	31	29
1960	3436	72	27	45
1961	3477	84	20	64
1962	3580	85	15	70
1963	3639	93	19	74
1964	3714	83	26	57
1965	3694	65	18	47
1966	3740	62	21	41

(b) Spring Bay 1968-76

Year	Estimated Mean Population	Births	Deaths	Natural Increase
1969	1240	26	11	15
1970	1260	32	15	17
1971	1416	25	12	13
1972	1526	33	13	20
1973	1630	31	12	19
1974	1730	37	17	20
1975	1750	33	5	28
1976	1770	29	9	20

[a] COMMONWEALTH BUREAU OF CENSUS AND STATISTICS, 1959-1972; *Demography Tasmania, 1959-72;* Commonwealth Bureau of Census and Statistics; Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1973-76; *Demography Tasmania, 1973-1976;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

† Demographic statistics are determined by calendar year and may differ from census figures.

immigrants, was closely connected with the woodchip industry. During this period, there were no other major developments begun and others were closing down (Alginates Pty, Rostrevor Estate). People retiring to Orford would have contributed to the increase, although only to a small extent. Most of the population growth occurred between 1971-74, coinciding with the first four years of TPFH's operations on the East Coast (Table 4.8).

The population of Spring Bay continued to expand after 1976 but at a much reduced level and mostly by natural increase. In the case of Esperance, problems within the primary industry sector gave rise to a population decline from the mid 1960s onwards. Between 1966-71, a decline in the male labour force of 3% was accompanied by a 6.1% loss in population, possibly representing displaced sawmill and orchard workers and their dependants leaving in search of employment elsewhere. However, following the elimination of many small orchards in the district, a massive 25% decrease in the male labour force between 1971-76 resulted in only 7.7% population loss. Several factors may help explain this. Greater population loss may have been arrested by early retirement of sawmillers and orchardists whose businesses had become uneconomic. Alternative employment may have been located outside the municipality in larger towns such as Huonville or Kingston. In addition to these factors, during the last decade, the Huon district has experienced an immigration of newcomers buying up land left idle by the severe agricultural decline in the district. These newcomers are usually young and well-educated with a fairly high socio-economic status and many still retain jobs in the city (Paterson *et al.* 1978; Gardner 1977). The location of new settlers is strongly correlated with distance from Hobart (Gardner 1977) and thus they are not as common in Esperance as in the more northern municipalities in the Huon Valley. They are present, however, particularly in the Castle Forbes Bay region and are often

referred to as the 'hippies' by some of the well-established locals. Their effect is to reduce net outmigration from the municipality.

Details of changing sex ratios are shown in Table 4.9. In both areas, male:female ratios higher than the State average (Australian Bureau of Statistics 1982a) reflect typical male-orientated rural employment situations. The influx of males associated with woodchipping in Spring Bay could be expected to exacerbate the situation, but this does not appear to have occurred. The Spring Bay population experienced a fall in 'masculinity' between 1971 and 1976. The decline appears to be related to an influx of women in their late twenties - early thirties. Many of these would have accompanied husbands in the woodchip industry, but employment-related factors also seem to be important. The female labour force increased by over 100% from 1981 to 1976. This was primarily due to expansion in community services, retail trade and 'other'. It is quite possible that these employment factors would explain why the female component of the population increase in Spring Bay between 1971-76 was over 40% higher than the male component. Similar trends are not evident in Esperance where the pulpwood industry appears to have had a negligible effect on the male:female ratio.

It could be expected that with the decline in employment opportunities and the population loss experienced by Esperance, the current age and sex structure of the municipality would be markedly different from that of Spring Bay; this does not appear to be the case. Both the age structure (measured as the relative proportion of each age group to the total population) and the male/female component thereof, are quite similar between the two communities (Australian Bureau of Statistics 1982a). Age structure profiles from Figure 4.4 show that although Spring Bay's population has bulged in the 25-39 year age group there has also been population growth in the older age groups. In other words, the influx of middle-aged people associated with the woodchip industry has been

TABLE 4.9

Male and female component of the population of Esperance and Spring Bay 1961-81[a]

(a) Esperance

	1961	1966	1971	1976	1981
Males	1805	1979	1902	1622	1601
Females	1631	1761	1606	1480	1443
Sex Ratio (Male:Female)	1.11	1.12	1.18	1.10	1.11

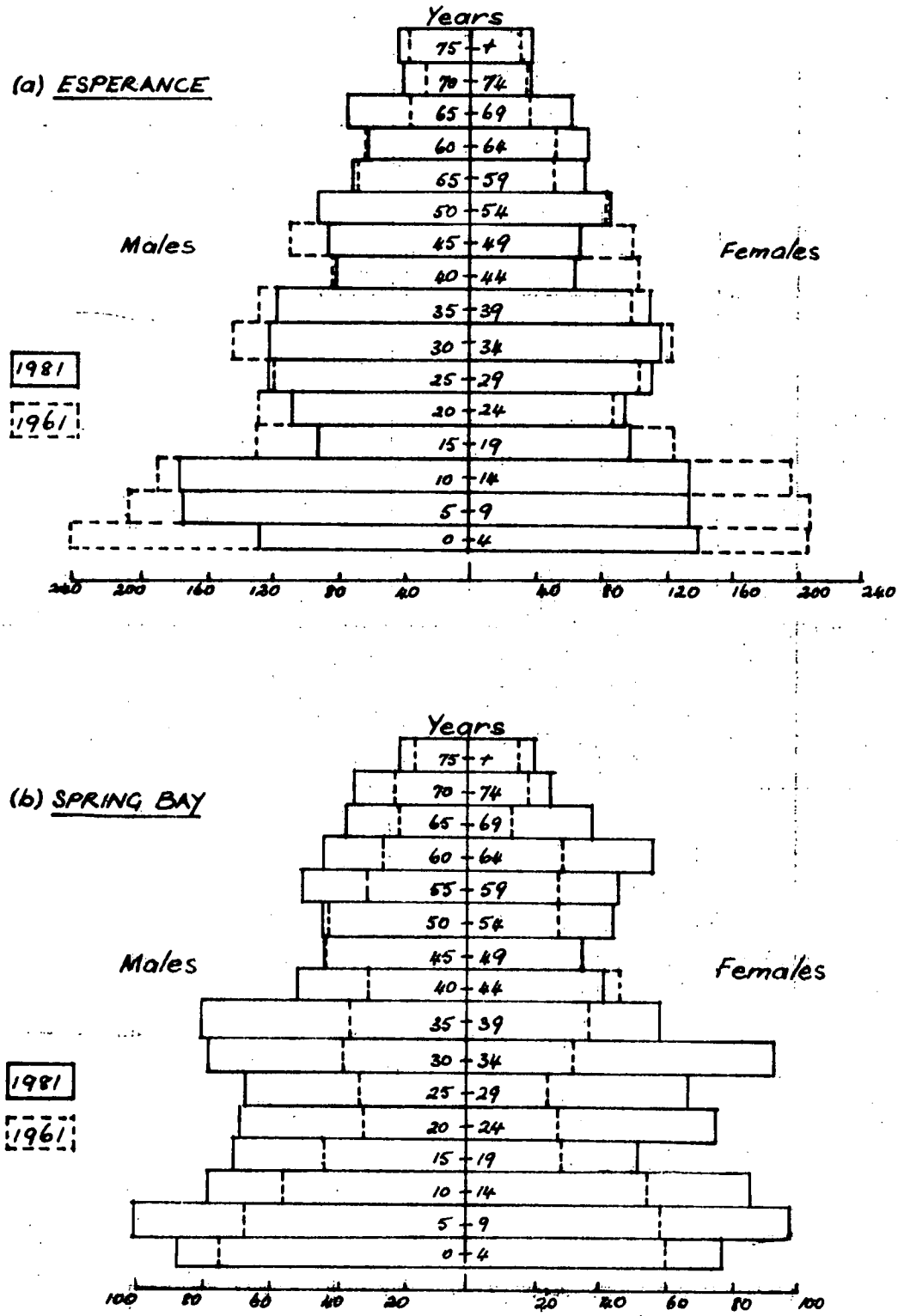
(b) Spring Bay

	1961	1966	1971	1976	1981
Males	625	644	753	882	973
Females	530	561	660	847	912
Sex Ratio (Male:Female)	1.18	1.15	1.14	1.04	1.07

[a] AUSTRALIAN BUREAU OF STATISTICS, 1961-81; *Australian Bureau of Statistics Census of Population and Housing - Characteristics of the Population and Dwellings in Local Government Areas, Tasmania, 1961-1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

FIGURE 4.4

Population profiles by age and sex of Esperance and Spring Bay: 1961-1981[a]



[a] AUSTRALIAN BUREAU OF STATISTICS, 1961-1981; *Australian Bureau of Statistics Census of Population and Housing - Characteristics of the Population and Dwellings in Local Government Areas, Tasmania, 1961-1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

counterbalanced by another influx of older people seeking retirement in the Orford district. The result appears to be a stable and expanding population structure. By contrast, Figure 4.4 depicts an ageing Esperance population, contracting within the lower age groups over the last twenty years.

4.4.2 Demographic Features in the Survey Samples

The survey samples, selected from residents 18 years of age and older, reflect some of the demographic features described in the previous section. Length of residence in each municipality is shown in Table 4.10. Some 56% of Esperance residents surveyed had lived all their lives in the municipality while, in Spring Bay, the figure was 30%. This reinforces a prior contention that although the proportion of older residents is similar for both areas, a significant percentage of those in Spring Bay has recently retired to the East Coast community. This group most likely represents the 27% of the sample who had moved into the district over the last decade and who did so for the qualities of the environment (Table 4.11). A higher proportion of new residents in the sample had moved into Spring Bay after the woodchip mill was built (37%). In contrast to Esperance, employment in the woodchip industry was the main factor behind this inmigration (Table 4.11). Only a small percentage of newcomers to the area came from outside Tasmania; many had an urban background with approximately a third coming from the Hobart region.

With over half the Esperance sample having lived in the community all their lives, migration patterns were different to those of Spring Bay. About 28% had arrived since establishment of the pulpmill in 1962; the main response given for moving into the area was family reasons, while employment opportunities both within and outside the pulpwood industry were of secondary importance (Table 4.12). This reflects the

TABLE 4.10

Length of residence in Esperance and Spring Bay[a]

	Esperance		Spring Bay	
Years	Number	%	Number	%
1 - 2	4	3.4	5	4.3
3 - 5	5	4.3	14	12.1
6 - 10	12	10.3	24	20.7
11 - 19	12	10.3	18	15.5
20+	18	15.4	20	17.2
All life	66	56.4	35	30.2

[a] Un-weighted results of stratified sample

fact that the pulpwood industry in Esperance did little to increase the municipal population; rather, it employed those seeking jobs within the area. For those who moved into the district prior to commencement of APM's operations, marriage and family reasons also featured prominently as an incentive to live in the municipality. When viewed in conjunction with the high proportion of life-time residents, it is not surprising that Esperance residents tend to be surrounded by an extensive family network. Due to a quite recent population influx and its urban orientated origin, the situation for many people in Spring Bay tends to be the opposite. In the samples, 45% of Spring Bay respondents and 72% of those in Esperance claimed to have many relatives living in or near their municipality (Table 4.13).

Because the survey sample was stratified in order to obtain adequate representation of the main occupational groups identified (see

TABLE 4.11

Reasons given for migrating to Spring Bay[a]

Length of Residence - years	Most important reason for coming to Spring Bay					
	Woodchipping Employment	Rural Employment	Other Employment	Marriage/ Family	Environment	Other
1 - 2	1	1	2	0	1	0
3 - 5	3	2	3	2	4	0
6 - 10	9	5	2	1	7	0
11 - 19	2	5	2	7	2	0
20 +	0	11	2	6	1	0
% of Total Sample	18.5	29.6	13.6	19.8	18.5	0.00

[a] Un-weighted results of stratified sample.

Due to the small cell sizes this table should only be regarded as an approximate indicator of actual trends.

TABLE 4.12

Reasons given for migrating to Esperance[a]

Length of Residence - Years	Most important reason for coming to Esperance					
	Wood Pulp Employment	Rural Employment	Other Employment	Marriage/ Family	Environment	Other
1 - 2	0	3	0	0	1	0
3 - 5	0	1	2	1	1	0
6 - 10	3	2	3	3	0	1
11 - 19	2	0	2	6	1	1
20+	2	4	4	8	0	0
% of Total Sample	13.7	19.6	21.6	35.3	5.9	3.9

[a] Un-weighted results of stratified sample.

Due to the small cell sizes this table should only be regarded as an approximate indicator of actual trends.

TABLE 4.13

Selected demographic characteristics of the survey samples[a]

(a) Responses to the question; "Do many of your relatives live in this municipality?"

	Esperance		Spring Bay	
	Number	%	Number	%
Yes	84	71.8	52	44.8
No	33	28.2	64	55.2

(b) Sex

	Esperance		Spring Bay	
	Number	%	Number	%
Male	86	73.5	82	70.7
Female	31	26.5	34	29.3

(c) Age

	Esperance		Spring Bay	
Years	Number	%	Number	%
15 - 19	1	0.9	1	0.9
20 - 24	5	4.3	11	9.5
25 - 34	30	25.6	28	24.1
35 - 44	28	23.9	23	19.8
45 - 54	22	18.8	19	16.4
55 - 65	20	17.1	20	17.2
65+	11	9.4	14	12.1

[a] Un-weighted results of stratified sample.

Section 5.1 for details of the logic and methods of sampling procedure) it was not possible to equally represent the sexes due to the sample size and low labour force participation of women. In both areas, the number of women in the sample was less than 30% (Table 4.13). The young are in a similar position. The age breakdown of the samples (Table 4.13) under-represents young people (less than 24 years old), particularly in Esperance. The implications of these and other features of the samples and ways in which they can be taken into account are discussed in the following chapter.

4.4.3 Local Perceptions of Socio-Demographic Changes

Community perception of the demographic changes brought about by the pulpwood industry generally reinforced the analysis of the available statistical information. Few Esperance residents considered that the pulp mill brought any new people to the municipality. To a certain extent, memories may have faded; pulp mill employees may now be regarded as locals. Most of the APM employees who initially lived in the small housing development constructed for company employees in the early 1960s have since built their own homes and moved out. It was suggested during the survey that APM staff partially filled a middle class 'hole' that existed within the community. Historically, Esperance has been a relatively isolated community with a preponderance of unskilled manual labour available. Prior to the advent of woodpulping, the community was clearly divided between a small elite class of property owners and a large group of mill hands and orchard labourers. Both groups tended to cling to the apple and sawmilling industries and many people within each were unable to adapt to basic changes experienced by these industries. Despite the small contribution by the more outward-looking staff and technicians associated with APM, the nature of the community has remained essentially inward-looking. The only exception to this obser-

vation has been the more recent penetration of people seeking an alternative lifestyle. Apart from this latter group, there appears to have been little inmigration to bring about change within the community.

By comparison, Spring Bay residents were well aware of the role of the woodchip industry in drawing people to Triabunna. This was generally thought to have been a good thing, for it was described as having previously been a quiet little country backwater nurturing a very closed tight-knit community. Original residents were suddenly surrounded by an influx of unknown people and there was some early antagonism that has not completely disappeared. Some newer residents still comment on the reserved nature of people born and bred in the district. It is the newer residents who have provided the impetus to social activity in the area in the form of more sports, clubs, and social activities. A number of newer residents came to Triabunna from the Huon Valley as jobs in the fruit industry were lost.

4.4.4 Summary

Examination of population trends and migration patterns in Spring Bay clearly confirms the strong influence of the woodchip industry. The period of greatest expansion coincided with the early establishment years of the industry. In Esperance, an initial population increase between 1961-66 was followed by a continuing population decline largely attributable to a contracting fruit industry. In this scenario the woodpulp industry has acted more as a buffer against further decline than a factor causing population growth.

Both the age structure and sex ratio of Spring Bay appear to have been affected by the woodchip industry with little noticeable impact in Esperance. A concurrent influx of people associated with woodchipping and those retiring to Orford have expanded the population structure in Spring Bay. More specifically, the age structure has ballooned in the 25-39 year age group as a result of inmigration from 1971-76. At the

same time a proportional increase in the number of females in Spring Bay has coincided with a major increase in female employment leading to greater participation in the labour force. In the case of Esperance, the population structure has continued to narrow, reflecting an ageing population as outmigration continues. This trend reflects the fact that a much higher percentage of Esperance respondents had lived in the municipality all their lives.

The above demographic trends were reflected in people's perception of community changes. The influx of newcomers to Spring Bay following establishment of the woodchip industry was clearly perceived as a major benefit to the area. In the survey sample, 37% had moved in after the woodchip mill was built; employment in the industry was the main influencing factor. By contrast, family reasons predominated in Esperance where the relationship between social changes and the woodpulp industry was not emphasized by the community. The static and inward-looking nature of Esperance is further reflected in the higher percentage of respondents who had lived in the municipality all their lives. The closed nature of the Esperance community, as opposed to that of Spring Bay, heavily influenced the community's perception and attitude towards woodpulping in the district.

CHAPTER 5

A COMPARISON OF COMMUNITY ATTITUDES AND PERCEPTIONS IN ESPERANCE AND SPRING BAY

Esperance and Spring Bay have been shown to have experienced quite different historical development especially in respect of forest industry. However, each has in turn been the focus of establishment of pulpwood-based industries which have involved incomplete processing of wood and thus employment, income, and associated benefits for local communities from this wood use have not been optimized. Although the industries share this common feature, the situation is more extreme in Spring Bay where the throughput of pulpwood is of the order of four times greater than in Esperance and all processing of the woodchips produced is undertaken in Japan. In Esperance, local processing is taken further to the pulp stage, while other Australian workers are involved in the final conversion to paper.

Differing impacts of the pulpwood industries on the retail/commercial sectors of each municipality have been shown to be related both to prevailing Australia-wide trends and to the level of such activity which was supported by pre-existing primary industry. The length of time since establishment of the pulpwood industries and trends in other local industries have created municipal populations with distinctly different demographic characteristics. Keeping in mind these different backgrounds, this chapter will continue to focus on the two municipalities in order to compare and contrast attitudes and opinions of rural populations toward pulpwood-based forestry development with particular emphasis on the export woodchip industry.

Information from communities most closely influenced by pulpwood industries is considered important since local people have most experience and knowledge of the daily operation of the industries and, as suggested in Section 2.1, it is in their name that particular forms and levels of wood use (such as that required by the export woodchip industry) are promoted and maintained by government and industry. Thus, this examination of attitudes and perceptions (the less tangible aspects

of development) complements and expands upon the discussion of more material effects and changes due to the industry as described in Chapter 4. It gives insights into two different stages of forestry development, that of a static or declining forestry community (Esperance) and that of a younger community based on a relatively new forest industry (Spring Bay). Although decisions made by APPM will affect the future course of Spring Bay development (and future attitudes are unpredictable) some indication of possible future community attitude changes in Spring Bay is sought from the comparison of attitudes of Esperance and Spring Bay people in 1981.

Comparison of attitudes in the communities was based on information gained from discussion with prominent local people (both associated with forestry and from other sectors of the community), and from questionnaire survey of selected representative samples of municipal residents. The methods used to select the samples, prepare and carry out the survey, and analyse the data collected are discussed in the first part (Section 5.1) of this chapter. Section 5.2 is concerned with people's attitudes toward life in the municipalities. This is considered an important introduction to examination of attitudes to the pulpwood industry since it provides an indication of the values held by different groups of people within each community and can be used to help explain particular attitudes to forestry in Section 5.3. Attitudes toward the communities and pulpwood industries are treated firstly in a more general manner, concentrating on overall similarities and differences. The aim is then to identify particular groups holding similar views and then to test group opinions of particular aspects of municipal life and, in turn, of forestry development. Thus, this examination proceeds on a number of levels, moving from general attitudes to specific attitudes and focussing on the communities before looking exclusively to the pulpwood industries.

5.1 Methods of Describing Opinions and Measuring Attitudes

In this study, the main instrument used to describe opinions and measure attitudes was a questionnaire (see Appendix C), the format of which was similar in some respects to questionnaires administered in Eden (Scott 1975) and in New Zealand (Smith and Wilson 1980). However, it was more detailed than either of these and consisted of six sections. These sought information in Esperance and Spring Bay on the following topics:

(a) feelings about the municipality as a place to live,

(b) changes which had occurred in the municipality,

(c) decision-making and information transfer in the municipality,

(d) feelings about all industries in the municipality,

(e) particular feelings about the pulpwood industry, and

(f) relevant personal particulars.

Section (e) provided direct information about people's opinions and attitudes toward the existence and operation of a large pulpwood industry within their municipality. The other sections were intended to provide background to understanding these attitudes. Little economic data was collected in this study; published statistics were used for this purpose.

Opinions and attitudes may be shaped or influenced by many factors; occupation, education, place of residence, age, and life experience are just some potentially relevant factors. In this study it was expected that industry of employment and whether or not a person had always lived in the municipality would both be particularly significant. The first factor was expected to be important since those people dependent on the pulpwood industry were thought likely to be most in favour

of it and those who were less dependent were thought to be correspondingly less favourable. The second factor was expected to be important because people who had always lived in the municipality were thought more likely to be critical of the industry due to its disruptive impact on the traditional way of life, while inmigrants (who were more likely to have come to the area for pulpwood employment) were expected to be more supportive.

Due to the expected influence of industry of employment on attitudes, it was considered necessary to adequately reflect the opinions of different employment groups; this was accomplished by selecting a random sample of all residents which was stratified by industry so that the numbers in each group would be large enough to make meaningful comparisons. It was assumed that sufficient numbers of life-time residents and inmigrants for such comparisons would appear in the samples. Electoral rolls for both municipalities provided some indication of the occupation of each resident over the age of 18 (although not necessarily up-to-date) and these rolls were used to compile lists of employment groups under the following headings:

(a) forestry (including chip or pulp and sawmill workers, bushworkers, log hauliers, and Forestry Commission employees),

(b) fishing/farming (including fishermen, deck hands, fish processors, orchardists, graziers, and farm labourers),

(c) miscellaneous (including retail, commercial, community, and recreational services),

(d) home duties/retired (including women working at home, retired people, and unemployed people).

A limitation of four employment groups was imposed by the sample size intended. Consequently, fishing and farming people were sampled as one

stratum and hence, any differences between these two groups cannot be clearly established. A random selection of equal size was made from each employment list and those people selected were notified by mail of the impending survey and its purpose. The questionnaire, which had been pre-tested on three previous occasions, was administered personally to 233 residents (116 in Spring Bay and 117 in Esperance) in November-December 1981.

Generally, people became quite engrossed in the questionnaire interview and seemed to find it quite an enjoyable experience. Because many respondents, especially in Esperance, exhibited a welcoming country style of hospitality, conducting interviews also proved interesting and enjoyable. Some people were initially a little apprehensive of the interview, mainly because they felt insufficiently informed about forest industry, but this feeling was often quickly dispelled after the first few general questions had been asked. Some forest industry people, especially in Spring Bay, remained very defensive during the interview, but others were particularly confiding. Interviews ranged from 30 minutes to two hours in length and the questions were generally well-understood.

The geographical unit of study, the municipality, was chosen to obtain a wider view than that of the mill town, but at the same time, retain a local, more regional view. However, the entire municipality was not always an area with which people completely identified. This was not so much true of Spring Bay as of Esperance, where distance had created some population enclaves whose concerns were of a very narrow local nature. Nonetheless, everyone was encouraged to respond with the whole municipality in mind.

Because of the attempt to assess divergent opinion within communities by using a stratified sample, people involved in forestry were over-represented by approximately 117% in the Esperance sample and by

75% in Spring Bay. Similarly, the Esperance sample contained proportionally 57% more fishing/farming workers than were in the total municipal population, while these workers were over-represented by about 100% in the Spring Bay sample. The miscellaneous group of employees was over-represented by about 9% in the Esperance sample but under-represented by some 13% in the Spring Bay selection. In both municipalities, the largest stratum (home duties/retired and unemployed) was proportionally under-represented, by 47% in Esperance and 41% in Spring Bay. Thus, the views of women were also under-represented in both samples. Table 5.1 shows the approximate proportion of each group in the total municipal populations compared with those in the sample populations. Discussion of overall attitude differences between the communities will take these varying sampling fractions into account by re-weighting the result for each employment group according to the actual proportion in the total population, and thus give a more representative total view. However, attitudes and attitude differences appear to have been caused by a variety of factors, amongst which employment does not seem to have been exceptionally important. Re-weighted results differed from the sample results by only 3-4% at most (and more often by about 1%) and this discrepancy did not alter apparent trends. Cross-tabulation of responses with socio-economic variables such as age or income has therefore been carried out using un-weighted data. However, since this is, nonetheless, a biased sample, tests of significance (such as χ^2) cannot be properly applied and so tables for discussion were selected by inspection according to the greatest differences in results shown.

The questionnaire contained a mixture of different forms of question which served different purposes. Open-ended questions provided the material for description of opinions and overall views. Other questions, consisting of scales, allowed measurement of attitudes

TABLE 5.1

Proportion of employment groups in the Esperance and Spring Bay populations and in the sample populations, and weighting factors applying to the sample groups.

Employment group	Esperance		Spring Bay	
	Total Population (>15 years)[a], N			
	Number	%	Number	%
Home duties/retired	1095	50.8	596	44.0
Miscellaneous	504	23.4	400	29.5
Forestry	265	12.3	218	16.1
Fishing/Farming	290	13.5	140	10.3
	Sample population, n			
	Number	%	Number	%
Home duties/retired	32	27.4	30	25.8
Miscellaneous	29	24.8	30	25.8
Forestry	30	25.6	33	28.4
Fishing/Farming	26	22.2	23	19.8
	Weighting factors (N/n)			
Home duties/retired	1.89		1.71	
Miscellaneous	0.92		1.14	
Forestry	0.46		0.56	
Fishing/Farming	0.63		0.52	

[a] AUSTRALIAN BUREAU OF STATISTICS, 1982; *Census of Population and Housing STE-LGA Small Area Summary Data - condensed format;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

to particular aspects as well as an indication of the strength of attitudes. The function of both types of question have been discussed by Moser (1958). Likert-type attitude scales were constructed and tested (see Appendix E) in order to examine attitudes to life in Esperance and Spring Bay and attitudes toward certain effects of the pulpwood industries in each municipality. In each case, a number of aspects, or *dimensions*, were selected for examination. These are listed and described before discussion of attitudes to municipal life and the pulpwood industry in the following sub-sections. For each dimension a number (two-four) of positively and negatively worded statements (or *items*) which were considered to be related to each dimension (and also found to show a range of opinions) were included in the attitude scale. People were required to reply to each scale item by one of five responses, ranging from *strongly agree* through to *strongly disagree*. In turn, each response was assigned a numerical value from minus two to plus two according to whether it represented an unfavourable (negative) or favourable (positive) attitude. This procedure is based on the technique outlined by Likert (1932). Items relating to each attitude dimension were grouped and the final result for each dimension was calculated as the sum of the values of component items. Positive, negative, and more neutral scores for each dimension were in turn grouped by inspection to form three or four broad *attitude groups*. If it is assumed that items truly (or at least partly) reflect the intended attitude dimension, group one represents a definite negative attitude, group two a more neutral position, and group three a definite positive attitude. In cases where four attitude groups are recognized, groups two and three represent the weak negative and positive position respectively, while groups one and four represent more extreme positions. For instance, one dimension of attitude towards life in both municipalities which is studied is the environmental; thus, people in environmental group three would be considered to show

particular appreciation of the scenery and awareness of the natural environment of the municipality in which they live. Whereas, those in environmental group one would be considered to be relatively unappreciative and uncaring for the natural environment of their municipality.

As far as possible, results from open-ended and close-ended questions are integrated in the following discussion, but in most cases these types of questions assess different facets of attitudes. Open-ended questions provide an indication of people's principal concerns, while attitude scales rank attitudes to particular aspects which in themselves may not be of great concern to people. Although not always explicit in this comparison of Esperance and Spring Bay, it must be remembered that the attitudes and opinions described are still only reference points of the true situation: a well coloured map rather than the terrain itself.

5.2 THE COMMUNITIES

The different geography and historical backgrounds of the municipalities suggest that Esperance and Spring Bay may support communities whose outlook and views are dissimilar, due in part to these factors. Since any such differences might in turn influence attitudes to the pulpwood industries, expressed views of the way of life and special characteristics of each municipality are taken together to build up a community picture. These are also used to delineate particular groups which partly correspond with occupational, educational or other divisions in local society. Therefore, the value of examining such community attitudes lies in providing a wider view of the nature and values of the communities within which attitudes to the pulpwood industries may become more understandable.

The establishment of a pulpwood industry in each municipality could have been expected to bring changes in the lifestyle of residents, especially in Spring Bay. Similarly, the operation of a relatively large, centralized industry in each of these rural communities may influence people's knowledge of and involvement in municipal affairs and decision-making (as suggested by Smith 1980). Therefore, ways in which life has changed in each municipality are described and the most likely causes assessed. Also, the level of knowledge about decision-making in the municipalities is examined as a means of gauging local involvement.

This section is devoted to teasing out shared and unique attitudes and perceptions of the two municipalities in order that such views can be compared with attitudes to the pulpwood industries (as described in Section 5.3) in an attempt to explain sources and causes of prevailing opinion. However, explanation is a difficult thing and "a person's opinion on virtually any issue is many-sided" (Moser 1958). Nonetheless, the general community attitudes and attitudes to particular aspects of life described and measured in this section contribute to placing attitudes to pulpwood industries in the context of the concerns and interests of local people.

5.2.1 General Community Attitudes

Communities are made up of different groups, large communities potentially having a greater number of bigger groups than small communities which may be more uniform. Although certain views may be more prevalent than others in a community, they may be held for different reasons and may not reflect the true diversity of opinion. Since both Esperance and Spring Bay are quite small (less than 4000 people), it might be expected that a number of common opinions would be shared by many residents and that only a small number of people would hold strongly

opposing views. The emphasis here (and in sub-section 5.2.2) will be on the identification of groups within the communities which held similar views; comparison between municipalities will then be made. By using information gained from open-ended questions, groups were identified according to their foremost preferences and pre-occupations.

Distinctions between municipalities were made readily apparent by comparing those things considered to be best and worst about life in each area. Table 5.2.A shows that Esperance people most valued the more traditional aspects of living in the country - the country lifestyle (for instance the "peace and quiet", the "space and freedom" and the "country life") and feeling of community identification and belonging which came from "knowing everyone" or having been "born and bred" there. These factors were less important in Spring Bay where people expressed greater appreciation of the environment and its recreational advantages. Such appreciation of "the climate", "the sea" and "the beaches" probably represented actual physical differences between the areas rather than a special sensitivity to their surroundings on the part of East Coast people.

Table 5.2.B shows the worst aspects of life in each area. Considerable differences in opinion were also apparent but in both cases a similar large proportion of people considered there to be no bad things about life in their area. The major drawback to living in Esperance was said to be the roads, mostly in reference to the Huon Highway, the main road link with Hobart. Lack of services and facilities (including education and those provided by local government) was also of some concern there, but not to the same extent as in Spring Bay where it was considered to be the worst aspect of living in that area. Spring Bay people were also less satisfied with the level of social and cultural activities and amenities ("there's no entertainment") than those in the more established Esperance community. These differences probably reflect

TABLE 5.2

Perceptions of life in Esperance and Spring Bay[a]

A. Best Aspects[b]

	Esperance			Spring Bay		
	Sample		Total	Sample		Total
	No.	%	%	No.	%	%
Country life	58	49.6	52.0	34	29.3	28.6
Environment	18	15.4	16.5	35	30.2	27.1
Community	22	18.8	18.5	13	11.2	14.2
Recreation	4	3.4	3.3	15	12.9	11.2
Employment	11	9.4	5.8	10	8.6	9.2
Other	1	0.9	0.5	3	2.6	1.4
No response	3	2.6	3.6	6	5.2	8.4

B. Worst Aspects[b]

	Esperance			Spring Bay		
	Sample		Total	Sample		Total
	No.	%	%	No.	%	%
No bad things	35	29.9	30.6	41	35.3	31.5
Roads	35	29.9	29.5	10	8.6	10.7
Services & facilities	16	13.7	14.9	29	25.0	26.8
Social & cultural	7	8.5	6.1	15	12.9	10.5
Employment problems	10	6.0	8.9	4	3.4	3.9
Community nature	5	4.3	3.7	8	6.9	8.8
Other	9	7.7	7.0	9	7.8	7.8

[a] The survey results are shown in the Sample columns. The Total columns contain sample results which have been re-weighted using the factors shown in Table 5.1 to take account of sample stratification and so better represent the total population.

[b] The categories of response shown represent a range of answers obtained from open-ended questions, representative selections of which are given in Appendix D.

the urban backgrounds and higher expectations of many new Spring Bay people, as well as a genuine lack of certain services and amenities for this rapidly expanded community. However, some similarities may be disguised in these differences, since many Esperance people travelled on the Huon Highway for the purposes of entertainment or shopping in nearby Huonville and Kingston or Hobart. Thus, lack of facilities in the municipality was not considered so great a problem as that of getting to them elsewhere.

Three groups of differing size may be tentatively identified according to what was valued most about living in each municipality; the groups were made up of those most concerned about the country life, the environment or the community. Another two groups (which were not mutually exclusive of the first), were also suggested according to what was considered as the worst aspect of municipal life; these groups were most concerned with the state of the roads or the quality or level of services and facilities. A sixth group could be defined as all those who felt there were no bad things about life in the area.

In both areas these six groups appeared to be based partly on male-female differences but, in Esperance, educational attainment and life in the municipality were also implicated. Tables 5.3 and 5.4 illustrate these relationships. Esperance males valued the community, and aspects of employment in the area, more so than females who were particularly appreciative of the country life (Table 5.3.A). By comparison, Spring Bay men and women felt similarly about country life and, while men showed greater enthusiasm for environmental and recreational aspects (especially the sea and the coast), women appeared to place more value on community-related factors (such as involvement in social activities; see Table 5.3.B).

Table 5.4 shows differences between men and women in their perception of the worst aspects of municipal life. In both places, men

TABLE 5.3

Differing perceptions of men and women of the best aspect of life in Esperance and Spring Bay[a]

A. Esperance

Best Aspect of Life	Men		Women	
	No.	%	No.	%
Country life	38	45.8	20	64.5
Environment	13	15.7	5	16.1
Recreation	2	2.4	2	6.5
Community	19	22.9	3	9.7
Employment	11	13.3	-	
Other	-		1	3.2

B. Spring Bay

Best Aspect of Life	Men		Women	
	No.	%	No.	%
Country life	25	30.5	9	32.1
Environment	29	35.4	6	21.4
Recreation	14	17.1	1	3.6
Community	5	6.1	8	28.6
Employment	7	8.5	3	10.7
Other	2	2.4	1	3.6

[a] Un-weighted results from stratified sample.

were less critical than women of life in the area. In the Spring Bay sample, this divergence was especially pronounced, where 45% of men, but only 12% of women felt that there were no bad things about living there. In the Esperance sample, men were more critical than this, and women less so. Here, men were mostly concerned about the main road, while women appeared equally concerned about a range of problems. In Spring Bay, both men and women considered the lack of various services and facilities to be the worst thing about living in the area, but this was felt more commonly by women. It also seemed that women were more dissatisfied with the level of social and cultural activities in Spring Bay, as well as being more sensitive to the nature of the community. Comments such as "gossipy" and "everyone knows your business" hint at the problems faced by some women who spend much of each day in the confined quarters of the housing estate of a single industry rural township.

Although the number of women interviewed was sufficient only to suggest trends, there appeared to be some division of opinion between Spring Bay women in regard to perception of the community; some were appreciative (Table 5.3) and others critical (Table 5.4). This division may reflect the growing pains of an evolving community, a "synthetic" community (Chapple 1976), made up of people from different places brought suddenly together. Community-related factors did not figure largely as either the best or worst features of men's lives in Spring Bay, both good and bad aspects possibly being overshadowed or made up for by the area's outdoor benefits. Comparing Esperance and Spring Bay shows that, overall, women found life more difficult than men, particularly in Spring Bay.

Although the six groups cannot be strictly defined according to male/female preferences, some tendencies have been noted. In Esperance, results suggest that educational attainment and life in the municipality

TABLE 5.4

Differing perceptions of men and women of the worst aspect of life in Esperance and Spring Bay[a]

A. Esperance

Worst Aspect of Life	Men		Women	
	No.	%	No.	%
No bad things	28	32.6	7	22.6
Roads	29	33.7	6	19.4
Services & facilities	11	12.8	5	16.1
Employment problems	6	7.0	4	12.9
Social & cultural	2	2.3	5	16.1
Community nature	5	5.8	-	
Other	5	5.8	4	12.9

B. Spring Bay

Worst Aspect of Life	Men		Women	
	No.	%	No.	%
No bad things	37	45.1	4	11.8
Roads	9	11.0	1	2.9
Services & facilities	18	22.0	11	32.4
Employment problems	2	2.4	2	5.9
Social & cultural	8	9.8	7	20.6
Community nature	3	3.7	5	14.7
Other	5	6.1	4	11.8

[a] Un-weighted results from stratified sample.

influenced attitudes to the area as a place to live. From Table 5.5.A, it can be seen that higher educated people valued the pace and peace of country life and the country environment, rather than the country community and a similar trend (Table 5.5.B) was apparent for those who had not lived all their lives in the municipality. Most higher educated people interviewed belonged to this latter group. Conversely, those with lower educational attainment and those who had always lived in Esperance, whilst most appreciative of the country life, also valued highly the local community, whether expressed in terms of the friendliness of local people or of personal feelings of family ancestry and tradition.

Summarizing community views on each municipality as a place to live shows that most Esperance people (52%), enjoyed the country way of life (including the peace and quiet and pace) of their area, while in Spring Bay this aspect was most appreciated by a similar number of people (29%) as rated the environment (27%) as the best aspect of life. The main road leading from Esperance to Hobart was the most unpleasant aspect of life in that municipality but, in Spring Bay, the level of services and facilities (especially educational facilities and local government services), was of most concern. The only factors which appeared to have some influence on these views were sex, level of education, and whether or not a person had spent all his/her life in the municipality. Other factors which did not seem to be especially influential included length of time lived in the area, income, industry of employment, occupational type, and age.

5.2.2 Community Attitude Groups

The previous section segregated the communities of Esperance and Spring Bay on the basis of the most important aspects (whether good or bad) which were felt to be associated with life in each municipality.

TABLE 5.5

Differing perceptions of best aspect of life in Esperance according to educational attainment (A), and whether or not people had lived all their lives in the municipality (B)[a]

A. Influence of Educational Attainment

Best Aspect of Life	Up to Schools' Certificate		Higher Schools' Certificate and beyond	
	No.	%	No.	%
Country life	48	49.0	10	62.5
Community	22	22.4	-	-
Environment	14	14.3	4	25.0
Employment	10	10.2	1	6.3
Recreation	4	4.1	-	-
Other	-	-	1	6.3

B. Effect of whether or not had lived all life in municipality

Best Aspect of Life	Lived in municipality all life		Only part of life	
	No.	%	No.	%
Country life	26	41.3	32	62.7
Community	17	27.0	5	9.8
Environment	10	15.9	8	15.7
Employment	6	9.5	5	9.8
Recreation	4	6.3	-	-
Other	-	-	1	2.0

[a] Un-weighted results from stratified sample.

However, this did not provide ground for comparison of attitudes toward particular aspects of life in these municipalities. Such comparison was sought as a means of identifying groups which felt especially strongly about certain aspects of life and which, in turn, might share common attitudes toward the woodchip/pulp industry.

For the purpose of identifying attitude groups, five aspects of attitudes to life, or *dimensions*, were studied;

(a) the environmental dimension (referring to appreciation and concern for the natural environment of the municipality),

(b) the social activity dimension (referring to leisure activities),

(c) the community unity dimension (referring to the closeness of the community),

(d) the livelihood dimension (referring to the employment situation),

(e) the services/facilities dimension (referring to services and facilities provided by local and state government, including educational facilities, health services, sewerage, roadworks and port facilities, as well as retail, commercial, and recreational services and facilities).

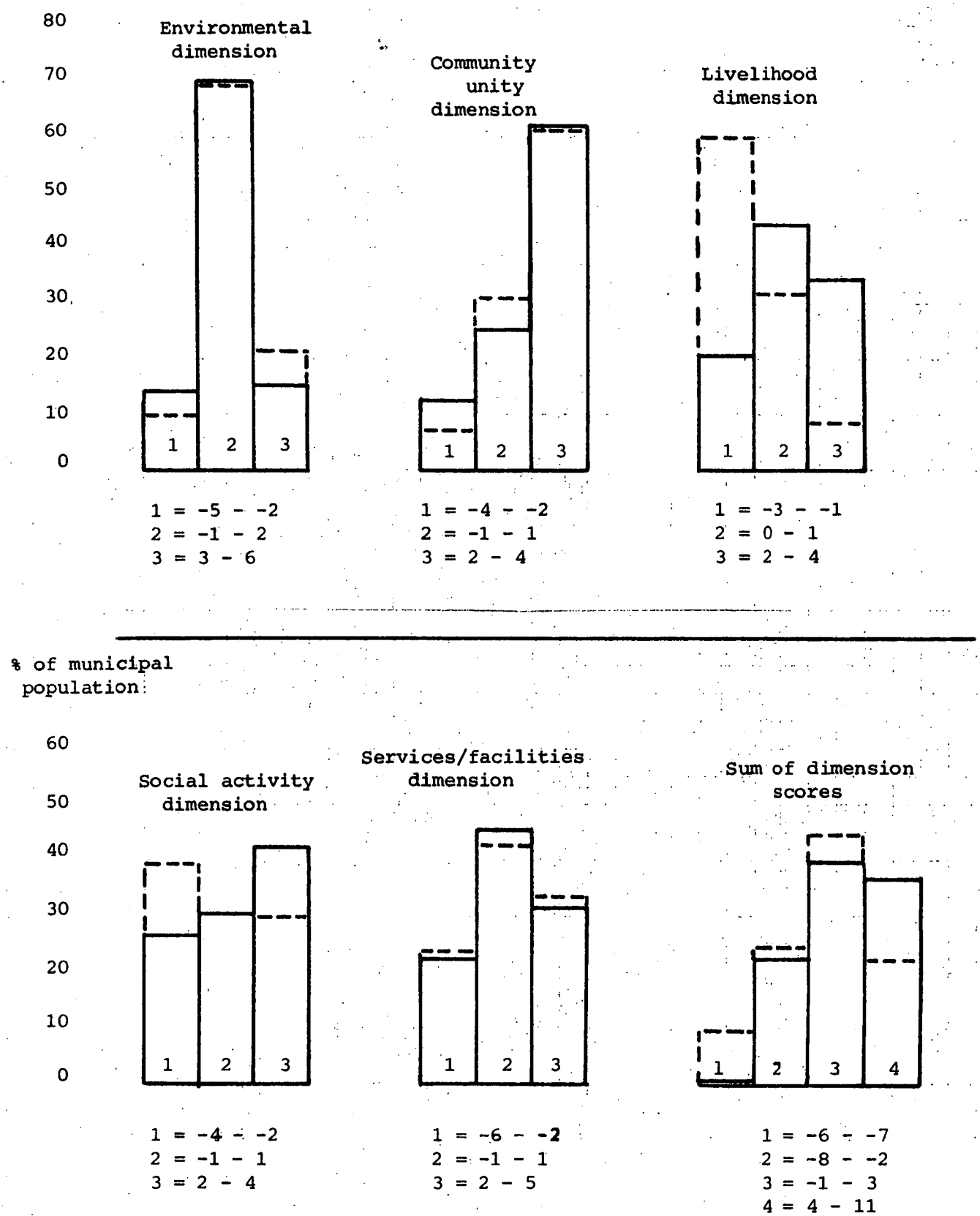
A Likert attitude scale (as described in sub-section 5.1.1) was constructed consisting of 15 statements (or items) of which two to four were applicable to each dimension. The theory and method of construction of the scale and testing of scale items are described in Appendix E and the actual scale items used in each dimension are listed there also. Dimension scores were obtained ranging from -8 to +8. Positive, negative and more neutral scores for each dimension were in turn grouped to form three broad attitude groups.

Figure 5.1 shows a graphical comparison of attitude dimension groups for Esperance and Spring Bay. In this figure the survey results have been re-weighted using the factors shown in Table 5.1 and so these histograms provide a reasonable indication of the proportion of the population in each municipality belonging to positive, negative, or neutral attitude groups in respect of the five dimensions of attitude toward life in the municipality. Scores for the environmental dimension indicate a slightly higher rating in Esperance and tend to substantiate the idea that attitudes toward the environment in Spring Bay were reactions to a very pleasant environment rather than due to the nature of the people themselves. A high proportion of people in each area held a fairly neutral attitude toward the natural environment. Many claimed to be "used to it" and/or to no longer notice their surroundings. This result probably represents a typical pragmatic country view. The community unity dimension did not capture the greater feeling of community identification already evident in Esperance although the negative attitude group one was slightly larger in Spring Bay. However, as discussed later, this dimension highlighted some division within the Spring Bay community. Trends apparent in the services/facilities dimension were very similar for both communities and suggested that, within each, considerable differences existed in satisfaction with this aspect of life.

Greatest differences between municipalities appeared in the social activity and livelihood dimensions, as well as for the summed "total attitude" (sum of items from all five dimensions). The trend in the social activities dimension for Spring Bay was the reverse of that for Esperance. Group three (the positive group) was largest in Spring Bay and group one (the negative group) was largest in Esperance. This may appear to partly contradict Table 5.2 in which lack of "social and cultural" activities was shown to be more keenly felt in Spring Bay than

FIGURE 5.1

Community attitude dimension groups for Esperance and Spring Bay



Scores for each dimension have been grouped differently according to apparent trends and the range of scores which are included in each attitude group is shown beneath the histograms.

in Esperance. However, that table was purely a priority list of concerns, whereas dimensions were compared in isolation from other factors which may have been considered more or less important. Therefore, while social activities were considered by many to be a problem in Esperance, particularly for young people and teenagers, it was not the most important one. In Spring Bay, where the largest group of people reported very favourably on the level of these activities, it nonetheless did not feature as one of the best things about the area but, instead, was cited as the second worst aspect of life there. Thus, a small core of people felt most deeply the lack of social activities (mostly city-type entertainment and activities for young people) but, for the majority, a satisfactory or high level of social activities was not accorded such importance.

Major differences in attitude existed toward employment in each municipality, as shown by the livelihood dimension. Whereas the most common attitude toward employment in Spring Bay was fairly neutral, in Esperance, the situation was seen as being far more severe as witnessed by the large proportion of people in group one. This result supports the conclusions made from the data in Table 5.2, where employment was shown to be the third worst aspect of life in Esperance but of least concern in Spring Bay.

Summing the attitude items to produce a "total attitude" to living in each municipality shows a noticeable proportion of Spring Bay people holding a more positive opinion than in Esperance (group four) and, conversely, virtually no Spring Bay people with an extreme negative view, but a number in Esperance felt this way about life in that municipality.

Groups which have been recognized according to community attitude dimension scores will be used later in relation to attitudes to forestry. Before discussing other aspects of the respective communities, the

the dimension groups will be examined to see if any reasons for their formation can be discerned.

Dimension groups were crosstabulated with a range of socio-economic factors which were considered likely to have some influence on attitudes. The results are shown in Table 5.6 to Table 5.11. These suggest a number of relationships but only two of which seem to have applied to both areas. Whether people had spent all their lives in the municipality or not seemed to have most effect on their attitudes to the area. In both municipalities, people who had not been born there showed greater appreciation and concern for the environment (see Table 5.6). Also, in the newer Spring Bay community, life-time residents showed a greater sense of community unity (see Table 5.7). Such a split was not apparent in Esperance with its greater proportion of life-time residents and absence of a large new inmigrant population. The only other variable which appeared to influence the same attitude dimension in both areas was age. Older people in Spring Bay were more satisfied with existing services and facilities while young people were most dissatisfied and over half mid-aged people expressed a more neutral view (see Table 5.8). In Esperance, there were similar trends in the attitudes of older people and younger people, but mid-aged people were far more evenly divided in opinion.

In both Esperance and Spring Bay industry of employment did not appear to be influential in shaping community attitudes.

An additional relationship apparent in Spring Bay involved the environmental attitude dimension and educational attainment (see Table 5.9). Proportionally more higher educated people showed strongly positive attitudes toward the environment, while most negative attitudes were expressed by those with lower education levels. Since not one of

TABLE 5.6

Influence of whether or not people had lived all their lives in Esperance or Spring Bay on appreciation of aesthetics and the natural environment[a]

Esperance

Life in Municipality	Aesthetic attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
Lived all life	13	20	45	68	8	12
Only part of life	2	4	34	67	15	29

Spring Bay

Life in Municipality	Aesthetic attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
Lived all life	11	31	22	63	2	6
Only part of life	9	11	57	70	15	19

TABLE 5.7

Influence of whether or not people had lived all their lives in Esperance or Spring Bay on attitudes toward community unity[a]

Esperance

Life in Municipality	Community unity attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
Lived all life	6	9	23	35	37	56
Only part of life	5	10	12	24	34	67

Spring Bay

Life in Municipality	Community unity attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
Lived all life	-	-	8	23	27	77
Only part of life	13	16	25	31	43	53

[a] Un-weighted results from stratified sample.

TABLE 5.8

Influence of age on attitudes toward services and facilities in Esperance and Spring Bay[a]

Esperance

Age in years	Services/facilities attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
18 - 34	12	33	18	50	6	17
35 - 54	14	28	18	36	18	36
55+	3	10	11	36	17	55

Spring Bay

Age in years	Services/facilities attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
18 - 34	13	33	21	53	6	15
35 - 54	8	19	24	57	10	24
55+	7	21	12	35	15	44

[a] Un-weighted results from stratified sample.

the higher educated (beyond Higher Schools Certificate) people in the sample had lived all his/her life in Spring Bay, this result may be related to that described previously between the environmental dimension and life-time spent in the municipality. Comparison of Tables 5.6 and 5.9 shows that nearly half of the strongly positive environmental attitudes recorded were a result of more highly educated people moving into the area.

In both municipalities it was not apparent that any factor particularly influenced attitudes associated with the social activity or livelihood dimensions and in Esperance there was no factor suggested as affecting attitudes toward the unity of the community. Factors which

TABLE 5.9

Influence of educational attainment on appreciation of aesthetics and the natural environment in Esperance and Spring Bay[a]

Esperance						
Level of Education	Aesthetic attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
Up to Schools' Certificate	14	14	70	69	17	17
Beyond Higher Schools' Certificate	1	6	9	56	6	38
Spring Bay						
Level of Education	Aesthetic attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
Up to Schools' Certificate	19	20	66	70	9	10
Beyond Higher Schools' Certificate	1	5	13	59	8	36

[a] Un-weighted results from stratified sample.

seemed to influence or be associated with some attitudes toward the community and life in each municipality were age, whether or not a person had lived all his/her life in the area, and level of education. Other variables which were crosstabulated with attitude dimensions but which did not appear to be influential, or for which cell sizes were too small to give a proper indication, include length of residence in municipality, industry of employment, occupational type, income and sex.

In summary, differences in attitude toward specific aspects of life in Esperance and Spring Bay as determined from attitude scales may reflect actual physical differences in the make-up and structure of the municipalities, as well as the existence of groups holding differing opinions. Actual differences appear to include the availability of employment and social activities for both adults and children - all of which were greater in the East Coast municipality. Because there is little indication of further growth in the woodchip industry, the employment situation in Spring Bay will likely worsen in the future as the young children of recently settled woodchip families grow up and enter the job market. The greater availability of social activities in Spring Bay seems to have developed as a direct result of the ideas and energy of new people (especially women), mainly associated with the woodchip industry.

Although, overall, each community held similar attitudes toward the environment, community unity, and services/facilities, these dimensions revealed different groups both within and between communities. For each dimension, distinct positive and negative attitude groups of differing sizes were apparent in both municipalities. Greatest divergence of opinion in both places was shown in respect of municipal social activities and services/facilities and also, in Spring Bay, in regard to local employment. These dimensions of municipal life, therefore, had the largest positive or negative attitude groups (see Figure 5.1).

Several smaller groups were identified according to a particular characteristic. The main groups were as follows:

(a) higher educated Spring Bay inmigrants with a strong environmental appreciation;

(b) life-time residents of Spring Bay with a strong sense of community unity;

(c) a group of Spring Bay inmigrants with a weak (or negative) sense of community unity;

(d) older people in both municipalities who were satisfied with the level of municipal services and facilities.

These results suggest time as an influential factor in the formation of community attitudes, whether counted in terms of a person's life-time in one place or in years of age. Thus, the newer Spring Bay community contained a greater number of groups of differing opinion than the older, more static Esperance community.

5.2.3 Perceptions of Change and Control

Overall community opinions and attitude groups previously identified provide one 'snap shot' of Esperance and Spring Bay in late 1981. Attitudes may change with altered circumstances in the future and may also have changed due to past events. This section examines perceptions of change in the way of life in the communities with the aim of relating changes to the advent or continued operation of the pulpwood industry. Also, opinions on decision-making and control over the direction of development in each municipality are described.

Estimates of the degree of change in the way of life in Esperance and Spring Bay are shown in Table 5.10. This suggests that more Esperance people perceived no change while, conversely, more Spring Bay people thought there had been a lot of change. This result is not nearly so

TABLE 5.10

Perception of past changes in the way of life in Esperance and Spring Bay[a]

Change in way of life	Esperance		Spring Bay	
	No.	%	No.	%
Not at all	24	20.5	17	14.7
A little	28	23.9	29	25.0
Some	19	16.2	17	14.7
A lot	46	39.3	53	45.7

[a] Un-weighted results of stratified sample.

pronounced as might have been expected given the growth in Spring Bay population since the early 1970s.

Changes in the way of life resulted in significantly different effects in each municipality. As can be seen from Table 5.11.A, over 50% of the sample considered Spring Bay to have become a more pleasant place to live, while nearly twice as many people in Esperance as in Spring Bay thought that Esperance remained unaffected or had become less pleasant as a result of the changes. Altogether, 42% of Esperance people sampled reported either no change in the way of life or changes which had not affected the area as a place to live. This compares with 28% in Spring Bay. The most pleasant and unpleasant changes reported are listed in Table 5.12.B, C. Differences between the areas represent the effects of population influx in Spring Bay, which simultaneously required and enabled improvement in services and facilities (for instance school additions, sealed town roads, more drains, new shops) as well as creating more leisure activities (clubs and pubs), through the efforts and patronage of new residents. As discussed in Section 4.3, the population increase was largely, though not entirely, caused by establishment of the woodchip industry. The pleasant changes

TABLE 5.11

Perceptions of the effects of changes in Esperance and Spring Bay[a]

A. Effect of changes in each area as a place to live

	Esperance		Spring Bay	
	No.	%	No.	%
More pleasant	37	31.6	62	53.4
The same	25	21.4	13	11.2
Less pleasant	18	15.4	11	9.5
No response	13	11.1	13	11.2
Way of life hasn't changed	24	20.5	17	14.7

B. Most pleasant change in area[b]

	Esperance		Spring Bay	
	No.	%	No.	%
More leisure activities	7	6.0	21	18.1
Services & facilities	7	6.0	19	16.4
Social relations	13	11.1	12	10.3
Employment	3	2.6	8	6.9
Other	7	6.0	2	1.7
No response	13	11.1	13	11.2
Way of life hasn't changed or is less pleasant	67	57.3	41	35.3

C. Most unpleasant change in area[b]

	Esperance		Spring Bay	
	No.	%	No.	%
Adverse social	9	7.7	8	6.9
Decline in industry and employment opportunities	6	5.1	1	0.9
Other	3	2.6	2	1.8
No response	13	11.1	13	1.2
Way of life hasn't changed or is less pleasant	86	73.5	92	79.3

[a] Un-weighted results of stratified sample.

[b] The categories of response shown represent a range of answers obtained from open-ended questions - representative selections of which are given in Appendix D.

cited related not so much to way of life as to conveniences of life, an increase in the availability of things usually found only in urban areas. Such developments had not occurred to the same degree or so recently in Esperance, where the most pleasant changes were discerned amongst the population itself - there was said to be some "new blood" and people were becoming more involved in local activities while some were described as adopting a "better outlook". Similar observations in Spring Bay dwelt more on the quantitative change in the numbers of people living there, on the "new life" gained from having more people in the community and on the new importance brought by a larger population.

Major causes of these pleasant and unpleasant changes are shown in Table 5.12. Of those who found Spring Bay more pleasant, 59% identified the woodchip industry as the main cause while, in Esperance, the pulp will was named by only 24% of people who thought the area more pleasant. Only a relatively small number of people considered each area to have become less pleasant, but most common causes were said to be the advent of the woodchip industry in Spring Bay and fruit industry decline in Esperance.

Major causes of change in the quality of life in Esperance and Spring Bay can be seen to have largely originated outside each municipality. Some changes, such as the level of local services, have been generated indirectly through increased population and carried out by local government. Sudden, as well as ongoing changes in the way of life, controlled by remote forces could perhaps be expected to have created feelings of powerlessness and vulnerability in the communities. Accordingly, assessment of knowledge of the activities of statutory bodies and industries whose decisions may affect the communities was made as a means of judging local people's feelings of involvement in and control over municipal development.

TABLE 5.12

Causes of change in Esperance and Spring Bay[a]

A. Most important cause of pleasant change

	Esperance		Spring Bay	
	No.	%	No.	%
Chip/pulp	12	10.3	44	37.9
Newcomer stimulus	6	5.1	5	4.3
Progress of time	6	5.1	3	2.6
Other industries	2	1.7	3	2.6
Other	5	4.3	4	3.4
Don't know/no response	19	16.2	16	13.8
Way of life hasn't changed or is less pleasant	67	57.3	41	35.3

B. Most important cause of unpleasant change

	Esperance		Spring Bay	
	No.	%	No.	%
Chip/pulp	2	1.7	6	5.2
Other industries	7	6.0	-	-
Other	7	6.0	4	3.4
Don't know/no response	15	12.8	14	12.1
Way of life hasn't changed or is more pleasant	86	73.5	92	79.3

[a] Un-weighted results of stratified sample.

Table 5.13 provides information on the level of awareness of the activities of State Government Departments. This table suggests that a large proportion of residents in both municipalities felt that they weren't told enough about the activities of certain departments in their

TABLE 5.13

Knowledge of decisions of State Government Departments in Esperance and Spring Bay[a]

Are people kept sufficiently informed by State Government Departments?

	Esperance		Spring Bay	
	No.	%	No.	%
Yes	24	20.5	16	13.8
No	75	64.1	87	75.0
Don't know	18	15.4	13	11.2

Government department cited as not providing enough information

	Esperance		Spring Bay	
	No.	%	No.	%
Main Roads	23	19.7	11	9.5
Lands	2	1.7	8	6.9
Forestry	6	5.1	2	1.7
Education	-		3	2.6
National Parks & Wildlife Service	-		1	0.9
Fisheries	-		6	5.2
Other	8	6.8	3	2.6
Couldn't mention a particular instance	36	30.8	53	45.7
People are kept informed or not sure	42	35.9	29	25.0

[a] Un-weighted results of stratified sample.

area. However, it is also apparent that many people, especially in Spring Bay, were unable to provide any evidence for this claim, for only 52% (Esperance sample) and 39% (Spring Bay sample) of those who were critical, did so. The importance of this is difficult to judge; it may

just represent a universal suspicion of government, or may indicate situations which were hard to describe or were not properly understood. Certainly in Spring Bay, the State Government was perceived as being neglectful and many people complained of the lack of an elected parliamentary representative from the East Coast. Again, the road link with Hobart was shown as being a major pre-occupation in Esperance since the Department of Main Roads was most commonly named as not providing people with enough information. Main roads were also the greatest concern in Spring Bay, but not to the same extent as in Esperance where several road deaths had occurred only months before the survey and where local people had for some time felt that the run-down highway reflected badly on the state of their municipality. Lack of information about decisions made by the Forestry Commission in connection with management of State Forest for pulpwood and sawlogs was reported by only 5% of Esperance people and less than 2% of Spring Bay people.

The degree of knowledge reported about local Government decisions is shown in Table 5.14. In both areas the majority of people interviewed again claimed to be badly informed by their local council. Of these, 45% of Esperance and 50% in Spring Bay actually recounted an instance to support this claim. Spring Bay people felt most greatly a lack of information on the provision of local services - drains, footpaths, gutters, sewerage, and water supply - which is in keeping with the interests of a rapidly established, but still young community. Also in Spring Bay, a small group of people, mostly Orford residents, complained of secrecy and insufficient information surrounding the use and up-grading of Charles St., (the main thoroughfare of this holiday/retirement town) for use by log trucks carting from south of Orford through to the chip mill in Triabunna.

In Orford, public concern over use of Charles St. as a logging route dates from 1976. However, the level of concern rose dramatically

TABLE 5.14

Knowledge of decisions of Local Government in Esperance and Spring Bay[a]

A. Are people kept sufficiently informed by Local Government?

	Esperance		Spring Bay	
	No.	%	No.	%
Yes	36	30.8	39	33.6
No	71	60.7	74	63.8
Don't know	10	8.5	3	2.6

B. First particular instance of lack of information

	Esperance		Spring Bay	
	No.	%	No.	%
Local services	6	5.1	20	17.2
Recreation facilities	8	6.8	4	3.4
Roads (chip/pulp related)	1	0.9	7	6.0
Roads (other)	3	2.6	1	0.9
Other	14	12.0	5	4.3
Couldn't mention a particular instance	39	33.3	37	31.9
People are kept informed or not sure	46	39.3	42	36.2

[a] Un-weighted results of stratified sample.

during 1980 as the rate of traffic on this road (then a narrow dusty lane) increased and TPFH offered to finance up-grading work. The accompanying newsclipping montage (Figure 5.2) illustrates prevalent feeling at the time. Local councillors who had either worked for TPFH or had woodchip interests did not refrain from voting on the decision at a special council meeting from which residents were barred. The

FIGURE 5.2

Newspaper reports of community feeling over the log truck route through Orford, Spring Bay, February - August 1980.

Objections to Orford timber project

Merc 20/2/80

THE Speaker in the House of Assembly, Mr Andrew Lohrey yesterday called for an environmental impact st[illegible]re a timber removal project begins near Orford.

Mr Lohrey said the operation would pose a safety threat to Orford and it could mean an environmental risk to the small beach resorts of Orford and Spring Bay.

But time is running out. The private contractor has until the end of this financial year to remove timber he has bought on Mr Jack Gray's property, known as The Rheban.

Spring Bay council clerk, Mr Darrell Laird said he expected timber cartage would have started last week.

He said the council wasn't very ha[illegible] about heavy logging trucks [illegible] the main roads [illegible] opera[illegible]

Log truck dangers

Merc 21/8/80

Each Tasmanian municipality is supposed to have a local disaster plan in conjunction with the State Emergency Service. Such a complex plan is designed to deal with a major emergency which could overwhelm the normally adequate resources of the district.

Among the many municipalities which have not yet produced such a plan is Spring Bay. One of the first points in such a plan is to identify potential local disaster areas, such as steep hills, bad bends, etc, and then take steps to minimise the danger.

Far from following this course, the Spring Bay Council is creating a new potential disaster area by not opposing the routing of two-way log truck traffic along Charles St,

Orford. This traffic will pass, in [illegible]particular, the local primary

Merc 22/4/80

[illegible]his year, a large log [illegible]t Orford Bridge. [illegible]d, and de- [illegible]. There were [illegible]he way. Nor [illegible] of months ago [illegible]e its jinker near [illegible] feel it would be [illegible]t on more good next occasion.

[illegible]ng other things, the [illegible]l Officer of Health, I [illegible]ed with the prevention [illegible]or both [illegible]e and, as I see it, [illegible] I feel I could no longer [illegible]fied in continuing in this [illegible] the Charles St route is [illegible]mented.

[illegible]aving attended accidents in the [illegible]st that have resulted in the death [illegible] children, I have absolutely no [illegible]ish to attend another. Certainly it [illegible]ill be expensive to find an [illegible]ternative route. But what value [illegible]ould be put on the life of just one [illegible]ild?

(DR) J. K. FROST.

Orford meeting on log truck[illegible]

[illegible]RE will be a public [illegible] on March 8 to [illegible]les Staby, [illegible]ori-

Merc 10/4/80

Orford residents protest at loggers

The concern of Mrs S. Gatehouse, of Rheban, typifies that of other residents. Measurements showed that several culverts on the sealed and gravel sections were too narrow to allow the school bus and a truck to pass, while poor visibility in several areas was an added hazard, said Mrs Gatehouse.

She said the gravelled section of Rheban R[illegible] dangerous [illegible]blind cor[illegible]es.

[illegible]ending almost as far as Bream Creek [illegible]ble for exploitation, and it is [illegible]e how one operator taking [illegible]icular property could [illegible] use the road [illegible]ators to use

[illegible]lain- [illegible]f the [illegible]age of [illegible]er

[illegible]RFORD residents, c[illegible] [illegible]afety of travelling [illegible] children among log[illegible] have taken positiv[illegible] Apart from sen[illegible] to members of [illegible] ment, deputati[illegible] Minister for [illegible] Field and the[illegible] ment, Dr [illegible]

A spok[illegible] said the [illegible] investig[illegible] Kelle[illegible] Th[illegible] rese[illegible] on[illegible] h[illegible] the[illegible] pecuniary interests of several councillors.

[illegible]

On Tuesday night, the residents decided that two representatives would ask the Minister for Local Government, Mr Field, to dismiss the nine-member council. However, Mr Field was on the North-West Coast yesterday, and the meeting had to be delayed.

Residents now believe an approach to Mr Field about

THE MERCURY, THURSDAY, 31-7-1980

Ombudsman next step in Spring Bay Council row

COMPLAINTS against the administration of the Spring Bay Council may be taken to the Ombudsman.

Orford residents will meet this morning to decide what action to take, and to seek legal advice on the issue of declaration of pecuniary interests of several councillors.

On Tuesday night, the residents decided that two representatives would ask the Minister for Local Government, Mr Field, to dismiss the nine-member council. However, Mr Field was on the North-West Coast yesterday, and the meeting had to be delayed.

Residents now believe an approach to Mr Field about

council "inconsistencies and actions" could mean the establishment of a commission.

They have been told that if their complaints are upheld, the ombudsman could ask the Government for a full council election.

The moves follow the refusal of the council to allow residents to enter the council chambers at Triabunna for a special council meeting on Tuesday night.

Before the meeting, more than 60 placard-waving people demonstrated outside the chambers over the council's plan to accept an offer from Triabunna woodchip company, Tasmanian Pulp and Forest Holdings, to spend $100,000 on upgrading Charles St at Orford, and to allow log trucks to use it.

The residents have been fighting a four-year battle with the council and the State Government to stop log trucks using the street — the East Coast holiday resort's main thoroughfare.

The Spring Bay Council is split over the issue. On Tuesday night, Crs Beth Bennett, Jim Scordilis, Tim Chesterman, and Roger Hamilton, backed a motion to allow the Press and residents' representatives into the meeting. Crs Tom Gillow, Neil Vance (deputy warden), Derek Madson, and Ian Mc[illegible] voted against the [illegible] was lost on [illegible]

Truck route demo tonight

Merc 29/7/80

[illegible]bout 100 people will be held [illegible]bers at Triabunna

Before the meeting, the resi[illegible] dents were given legal advice that the council could not bar residents from the meeting before it began.

The council clerk, Mr Laird, said after the meeting that section 127 of the Local Government Act allowed the council to close a special meeting to the public.

The special meeting was held to discuss negotiations with TPFH on its offer to rebuild Charles St, and to set [illegible] for 1980-81.

road was finally reconstructed in 1981, but it was not being used for log transport at the time of the survey and by then, Orford feeling seemed to have subsided to a resentful simmer.

People who felt adequately informed by both State Government departments and Local Government often added that this would also be the case for everyone if he/she were sufficiently interested and inquiring. Given that over 60% of the sample considered local people to be insufficiently informed by both levels of government, this may imply either a lack of interest or lack of opportunity and hence significant lack of participation in the affairs of each community. The fact that large numbers of people in each area were not able to mention an occasion on which they were not adequately informed may suggest a certain lack of interest, although this feeling was probably no greater than in other communities. It seems likely that Esperance residents haven't been told enough by the State Government about plans for the Huon Highway and neither have Spring Bay residents been informed enough by their local council about the timing and siting of local services.

A quite different response was received in respect of the provision of information by industry. As shown by Table 5.15.A, a much lower proportion of the samples (45% in Esperance and 35% in Spring Bay) felt insufficiently informed by industry. The pulpwood industry was cited most frequently in the respective communities (by 20% of the Esperance sample) in connection with lack of information. Again, a common feature was the inability to offer particular instances. From Table 5.15.B, it can be seen that approximately half those feeling ill-informed specified neither industry nor circumstances. These widespread "general impressions" may also reflect a "no one is ever told enough by anyone" reflex, but people did not exhibit the same degree of vehemence toward industry in respect of information transfer as was shown toward local and State government. A number of people considered that it was not industry's

TABLE 5.15

Information about local industries in Esperance and Spring Bay[a]

A. Are people told enough by local industry?

	Esperance		Spring Bay	
	No.	%	No.	%
Yes	46	39.3	57	49.1
No	53	45.3	40	34.5
Don't know/no response	18	15.4	19	16.4

B. Industry named in first instance as providing insufficient information for local people

	Esperance		Spring Bay	
	No.	%	No.	%
Chip/Pulp	24	20.4	14	12.0
Fishing	1	0.9	4	3.4
Farming	3(apple)	2.6	-	
Other	1	0.9	1	0.9
No response	24	20.5	21	18.1
Not applicable	64	54.7	76	65.5

[a] Un-weighted results of stratified sample.

responsibility to inform the local community. However, this result may point to a low level of community understanding of the internal and external forces which affect local industries, a conclusion which probably holds true for many urban and rural communities.

In spite of claiming to be very poorly informed by local and State government and not being very well informed by industry, over 50% of the sample in each municipality felt that local people had enough say in the way the municipality was developing (Table 5.16). This rather

contradictory situation is also suggestive of a typical lack of interest in municipal affairs. However, it may have represented a defensive response with local people not wishing to express any feelings of powerlessness which they may have had. Many people appeared to consider only a very narrow definition of development and would, for instance, cite public meetings as examples of local involvement.

TABLE 5.16

Local involvement in municipal development[a]

Do local people have enough to say in municipal development?	Esperance		Spring Bay	
	No.	%	No.	%
Yes	70	59.8	62	53.4
No	39	33.3	47	40.5
Don't know	8	6.8	7	6.0

Comparing changes in the way of life in Esperance and Spring Bay shows that, although both areas were felt to have changed a great deal, these changes (largely attributed to the woodchip industry) had proved more pleasant in Spring Bay than they had in Esperance. Not only had Esperance changes proved less pleasant, but the woodpulp industry was seen to be less responsible for whatever pleasant changes had occurred.

Comparing perceptions of the level of involvement of local people in municipal decision-making and development shows that both communities claimed a similar lack of information on State and local government decisions but few of these were forestry-related; in spite of this, a majority of people in both areas felt local residents to be sufficiently influential in municipal development.

5.2.4 Summary

In summary, it can be seen that, although the communities shared common features, there were some distinctive differences. Common features included a high value placed on the peace and quiet and pace of country life (although this was much more highly developed in Esperance) and a considerable number of people (31-32%) who were completely free of criticism of municipal life. In all, most people expressed satisfaction with life in their respective municipality.

The survey sample also suggested that, overall, the communities held similar opinions toward the natural environment and about the unity or "belongingness" of the community, and about the level of services and facilities in each municipality. However, the importance placed on these aspects varied; the environment was valued more widely in Spring Bay and, likewise, the community more so in Esperance. Lack of services and facilities was felt to be more of a problem in Spring Bay. Differing attitudes toward social activities and employment were held, suggesting a more satisfactory situation in these respects in Spring Bay.

Within each community, men and women also held similar opinions of aspects of life but differed in the value placed on each. Men valued their community to a greater extent than women in Esperance but, in Spring Bay, women felt more strongly toward their community than men, who placed greater importance on their environment. In both areas, women noticed most acutely the shortcomings of municipal life highlighting the male-orientated nature of rural and forest-based communities.

The most noticeable differences in attitude to aspects of municipal life were between people who had always lived in their municipality and those who had not. People who had moved to each area were particularly appreciative of aesthetics and the natural environment, while those who

had always lived there were much less so. In Spring Bay, many of these newcomers were more highly educated than life-time residents. Also, in Spring Bay newcomers expressed a much weaker sense of community unity or belonging than those who had always lived there. Differences between these two groups in Esperance were not over attitudes to particular aspects, but rather involved the relative value placed on the country life and the community; life-time residents valued the community to a greater extent than the others who, in turn, placed more importance on the country life of Esperance. Higher educated Esperance people also found the country lifestyle most appealing. In both municipalities, older people were more satisfied with local services and facilities than younger people.

This comparison of community attitudes provides an indication of the values and preferences of people living in areas where forest-based industry is one of the most important activities. However, in many cases, pleasant changes perceived as being caused by these industries (Table 5.11) were not related to aspects of municipal life which people most valued (Table 5.2). This possible contradiction or conflict of attitudes is one of those examined in greater detail in the following section in which woodchip/pulp attitudes are the prime concern.

5.3 THE PULPWOOD INDUSTRIES

The fact that the pulpwood industry occupies such a prominent position in both municipalities (and is widely recognized as a major, if not *the* major source of prosperity and employment) could be expected to strongly influence attitudes towards it. In fact, it was expected that most people would support the industry on these grounds. Hence, to describe finer nuances of feeling and opinions on particular aspects (without having these coloured by an overall employment-generated

attitude), a two-level approach is adopted, similar to that used in analysis of community attitudes. An estimate of overall levels of support for the industry is provided by information from broad, direct questions, while attitudes toward the industry effect in certain instances are gauged through attitude scales. Pulpwood attitude groups between and within municipalities are also identified and the influence of socio-economic factors and community attitudes on these groups is examined.

5.3.1 General Attitudes to the Pulpwood Industry

This examination of general attitudes to the pulpwood industry covers overall feelings toward the industry which are described as either favourable or unfavourable, the main reason for holding this opinion, the nature of problems, if any, perceived by those in favour of the industry and the good points, if any, recognized by those unfavourable towards the industry. Table 5.17.A shows the degree to which the industry was favoured in each municipality. The Spring Bay community seemed to be more in favour of the woodchip industry than the Esperance community was of the woodpulp industry. However, both industries were strongly supported in their respective municipalities.

Table 5.17.B, C shows, additionally, the first reason people gave for holding the particular view of industry stated. Employment was the main reason given in support. The second most important reason cited in support of these industries was community dependence ("it keeps the place alive", "it would be a ghost town without it...") and this was related to employment. It seemed that the chip mill was perceived as having a more wide-reaching influence in Spring Bay than the pulp mill had in Esperance. Also, a noticeable difference between communities was the more frequent reference to forest management ("regenerating better forests", "getting rid of the old, useless timber...") in Spring

TABLE 5.17

Overall feeling toward the pulpwood industry and reasons given for this

A. Overall Feeling

	Esperance			Spring Bay		
	Sample		Total[a]	Sample		Total[a]
	No.	%	%	No.	%	%
Favourable	91	77.8	79.4	104	89.7	86.8
Unfavourable	23	19.7	18.1	12	10.3	13.2
Don't know	3	2.6	2.8	-	-	-

B. First Reason for Feeling Favourable[b]

	Esperance		Spring Bay	
	No.	%	No.	%
Employment	61	52.1	54	46.5
Community dependence	16	13.7	27	23.5
Forest management	10	8.5	20	17.2
Other	2	1.7	3	2.6
Don't know/no response	2	1.7	-	-
Feel unfavourable/don't know	26	22.3	12	10.3

C. First Reason for Feeling Unfavourable[b]

	Esperance		Spring Bay	
	No.	%	No.	%
Forest management/environment	18	15.4	8	6.9
Social/economic	4	3.4	4	3.4
Don't know/no response	1	0.9	-	-
Feel favourable/don't know	94	80.4	104	89.7

[a] Re-weighted sample results which better represent proportions in the total population by adjusting for sample stratification.

[b] The categories of response shown represent a range of answers obtained from open-ended questions, representative selections of which are given in Appendix D. Results are un-weighted.

Bay as a reason for favouring the local woodchip industry. It seemed that many people had absorbed the common forestry arguments for export woodchipping, perhaps because it has been so controversial and, as participants they felt in particular need of justifying the activity from the forestry, as well as from the employment, perspective.

Aspects of forest management and the forested environment were also the causes of greatest difference between municipalities as reasons for not favouring the pulpwood industry. These were of greatest concern to Esperance people who were particularly anxious about what they saw as destruction of forests, environmental degradation, or the taking of the best young wood. East Coast forests were generally viewed (in keeping with the official Forestry Commission and industry line), as old and run-down with the result that few people showed any anxiety at the level or manner of their utilization.

On the basis of their responses to further questions, people who expressed a favourable or unfavourable attitude toward the pulpwood industry were in turn grouped as those

(a) who were in favour of the industry and felt that it did not have any significant problems;

(b) who, although favourable, considered the industry to have significant problems;

(c) who were unfavourable but would admit some good points;

(d) who were unfavourable and felt that the industry had no good points.

Table 5.18 shows that group (b) made up over 36% of both samples. In Esperance, most people suggested significant problems existed in the pulpwood industry despite their overall support for it. Additionally, problems perceived by this group differed significantly between municipalities. In Spring Bay, the main concern was with the deterioration of

TABLE 5.18

Comments on the pulpwood industry by those who favoured it

A. Does it Have Any Significant Problems?

	Esperance			Spring Bay		
	Sample		Total[a]	Sample		Total[a]
	No.	%	%	No.	%	%
Yes	47	40.2	39.6	48	41.4	36.6
No	41	35.0	35.6	56	48.3	50.2
Don't know	3	2.6	4.9	-	-	-
Feel unfavourable/don't know	26	22.3	20.9	12	10.3	13.2

B. What Significant Problems[b]

	Esperance		Spring Bay	
	No.	%	No.	%
Forest environment	24	20.5	19	16.4
Road damage/danger	4	3.4	21	18.1
Social/economic	15	12.8	8	6.9
Other	4	3.4	-	
Feel unfavourable/don't know	26	22.2	12	10.3
Feel favourable/don't know/no significant problems	44	37.6	56	48.3

[a] Figures in this column are re-weighted sample results which better represent proportions in the total population by adjusting for sample stratification.

[b] Categories of response represent a range of answers obtained from open-ended questions, representative selections of which are given in Appendix D. The figures in this table are un-weighted sample results.

roads through logging traffic and, to a lesser extent, the dangers caused by large numbers of trucks on narrow local roads. Most people were supportive of truck drivers, placing blame for the state of the

roads on government inactivity and inadequate preparation before commencement of log hauling. Environmental effects associated with logging and aspects of forest management were also seen as significant problems in Spring Bay, while in Esperance these matters formed the greatest area of concern. Specific problems in both areas included air and water pollution from the mills, climatic changes, erosion and siltation problems, disruption of wildlife communities, wood wastage, insufficient regeneration, and loss of forests. Many Esperance people claimed to have previously considered pulpwood cutting extremely wasteful, but that this situation had been rectified by the recent introduction of a mobile chipping unit to supply the new solid fuel boiler at the pulp mill. (This boiler, which became operational in early 1981, was designed to burn approximately 26 000 tonnes per annum of woodchips mixed with coal.) More Esperance people perceived problems of a socio-economic nature, including instability, lack of adequate financial returns to the community and insufficient local processing of wood.

Group (c) (those unfavourable to the pulpwood industry who recognized positive aspects of the local operation) comprised virtually everyone who was not in favour of the industry (Table 5.19). In both communities, most critics felt compelled to admit the local importance of pulpwood industry employment. However, neither operation was widely regarded as having any other redeeming feature. The other group (group (d)) was so small that the totally negative response to pulpwood processing can be disregarded.

A breakdown of each community according to overall attitudes to the pulpwood industry is shown in Table 5.20. Here, those who expressed reservations about the industry, and those who were unfavourable, have been linked to show the total numbers of people who had some criticism of the industry. They amounted to approximately 50% of the population of Spring Bay and over 56% of Esperance.

TABLE 5.19

Comments on the pulpwood industry by those who were not in favour of it[a]

A. Does it Have Any Good Points?

	Esperance		Spring Bay	
	No.	%	No.	%
Yes	21	17.9	10	8.6
No	2	1.7	2	1.7
Feel favourable/don't know	94	80.3	104	89.7

B. What Good Points?

	Esperance		Spring Bay	
	No.	%	No.	%
Employment	19	16.2	10	8.6
New People	1	0.9	-	
Other	1	0.9	-	
No good points	2	1.7	2	1.7
Feel favourable/don't know	94	80.3	104	89.7

[a] Un-weighted results of stratified sample.

TABLE 5.20

Summary of overall attitudes to the pulpwood industry

	Esperance			Spring Bay		
	Sample		Total[a]	Sample		Total[a]
	No.	%	%	No.	%	%
Completely favourable	44	37.6	40.5	56	48.3	50.2
Favourable with reservation / Unfavourable with reservation	68	58.1	55.0	58	50.0	48.1
Completely unfavourable	2	1.7	1.7	2	1.7	1.7
Don't know	3	2.6	2.8	-	-	-

[a] Figures in this column are re-weighted sample results which better represent proportions in the total production by adjusting for sample stratification.

The foregoing descriptive outline of attitudes to the pulpwood industry indicates that these have been largely influenced by employment considerations. In keeping with the lower level of dependence on the pulpmill for employment in Esperance, as well as less satisfaction with its socio-economic benefits, the Esperance community appeared significantly less favourable than Spring Bay people toward the pulpwood industry. Environmental factors and aspects of forest management featured importantly as secondary considerations, particularly in Esperance.

These overall attitudes were then examined further by cross-tabulation with a range of socio-economic variables including occupation, educational attainment, age, sex, income, length of time lived in the municipality, whether or not people had always lived in the municipality and also with community attitudes. This was intended to give an indication of overall attitude differences within and between the communities. Differences between the views of men and women and between people who had always lived in the municipality as opposed to those who had not were found to be significant in Spring Bay but not in Esperance. These two factors have also been suggested as influencing attitudes toward life in both municipalities (see Section 5.2). As a group, women were less favourable toward the woodchip industry than men in the Spring Bay sample, but the unfavourable group in Esperance was comprised mostly of men (Table 5.21).

Whereas, in Spring Bay all the life-time residents interviewed were favourable to the pulpwood industry, in Esperance this group viewed it less favourably than those who had moved into the area, although the difference between Esperance groups was not as marked (Table 5.22).

Different attitudes of life-time residents in each municipality may have represented the effects of time or more fundamental differences in outlook between the two evident groups. Over the years since establishment of the pulpmill in 1962, there has been greater time and

TABLE 5.21

Overall opinions of men and women toward the pulpwood industry[a]

Esperance				
	Men		Women	
	No.	%	No.	%
Favourable	64	74.4	27	87.1
Unfavourable	19	22.1	4	12.9
Don't know	3	3.5	-	

Spring Bay				
	Men		Women	
	No.	%	No.	%
Favourable	77	93.9	27	79.4
Unfavourable	5	6.1	7	20.6

[a] Un-weighted results from stratified sample.

TABLE 5.22

Overall opinions of the pulpwood industry according to whether or not people had lived all their lives in the municipality[a]

Esperance				
	Lived in municipality all life		Only for part of life	
	No.	%	No.	%
Favourable	48	72.7	43	84.3
Unfavourable	16	24.2	7	13.7
Don't know	2	3.0	1	2.0

Spring Bay				
	Lived in municipality all life		Only for part of life	
	No.	%	No.	%
Favourable	35	100	69	85.2
Unfavourable	-	-	12	14.8

[a] Un-weighted results from stratified sample.

opportunity for the expectations and hopes of Esperance life-time residents to be met than in Spring Bay where life-time residents appear to be still enthusiastic about the sudden increase in growth and importance of their area. Some Esperance life-time residents described a sense of growing disillusionment for a number of reasons: promises of further processing of pulpwood for paper manufacture had not eventuated; there was concern that pulpwood cutting had proved to be wasteful rather than waste-using, and also it was felt that the needs of the pulp industry could be impairing the future sawlog supply.

Overall opinions of the pulpwood industry were also compared with community attitude dimension groups derived in Section 5.2. In Spring Bay, appreciation of the municipal environment appeared to influence overall attitudes to the woodchip industry (Table 5.23). As a group, those who most appreciated the environment (group three) were also least favourable to the industry, and all those who were least appreciative of the environment (group one) were in favour of the woodchip industry. In Esperance, the situation was similar in some respects, in that the environmental group three least favoured the pulp industry. However, unlike the East Coast residents, some people who were unappreciative of environmental aspects also felt unfavourably of the pulp industry in Esperance. Although differences between these Esperance groups were not as clear, they support the suggestion that opposition to the pulp industry came from a wider cross-section of the population than was the case for the woodchip industry in Spring Bay.

Although several relationships have been suggested between the general views held of the pulpwood industry and socio-economic and attitude dimension groups, none of the latter was found to influence people's reasons for feeling favourable or not toward the industry. However, of those favourable in Esperance and Spring Bay, perception of significant problems associated with the pulpwood industry appeared to differ between

TABLE 5.23

Influence of attitudes toward the environment in Esperance and Spring Bay on overall opinions of the pulpwood industry[a]

Overall opinion of the pulpwood industry	Environment attitude groups					
	1		2		3	
	Esperance					
	No.	%	No.	%	No.	%
Favourable	11	73.3	65	82.3	15	65.2
Unfavourable	4	26.7	11	13.9	8	34.8
Don't know	-	-	3	3.8	-	-
	Spring Bay					
	No.	%	No.	%	No.	%
Favourable	20	100	76	96.2	8	47.1
Unfavourable	-	-	3	3.8	9	52.9

[a] Un-weighted results from stratified sample

men and women. Proportionally nearly twice as many men as women noted significant problems associated with the industry (Table 5.24).

In Spring Bay, one factor was suggested as influencing perception of problems associated with the woodchip industry. As shown in Table 5.25, people who felt most positively toward social activities in the municipality (group three) also reported most woodchip problems and, conversely, those who were least satisfied with social activity (group one) were least critical of the woodchip industry.

Examination of overall attitudes to the pulpwood industry has so far concentrated on the number and identification of those who were favourable or not, why people felt this way and whether they held any reservations (good or bad) about the industry. Significant differences

TABLE 5.24

Differing perceptions of men and women (who favoured the pulpwood industry) of the existence of significant problems associated with it[a]

Perception of problems	Men		Women	
	Esperance			
	No.	%	No.	%
Significant problems	38	59.4	9	33.3
No significant problems	26	40.6	15	55.6
Don't know	-	-	3	11.1
	Spring Bay			
	No.	%	No.	%
Significant problems	40	52	8	30
No significant problems	37	48	19	70

[a] Un-weighted results from stratified sample.

TABLE 5.25

Spring Bay: Influence of attitudes to municipal social activities on perception of problems associated with the woodchip industry[a]

Perception of problems	Social activity attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
Significant problems	6	24.0	17	50.0	25	55.6
No significant problems	19	76.0	17	50.0	20	44.4

[a] Only those people who were in favour of the industry are included in this cross-tabulation. The figures are un-weighted results from the stratified sample.

between municipalities were indicated in some of these respects. Proportionally more people favoured the woodchip industry on the East Coast than favoured the pulp industry in the southern municipality, but the

reasons given were similar in both areas; employment was most important, followed by community dependence and concern for forest management. Similar numbers of people (about 40%) noted significant problems with the pulpwood industry but the nature of these differed between municipalities; road damage and danger headed the list in Spring Bay and forest utilization and the environment in Esperance. In both places, most people who did not favour the industry, nonetheless recognized its employment as a positive aspect. In all, the Spring Bay community was evenly divided between those completely favourable to the industry and those who, although claiming to be either favourable or unfavourable, held some reservations. In Esperance, this latter group made up nearly 60% of the sample.

Comparison of recognized groups within the Esperance and Spring Bay communities revealed an apparent lack of common attitudes to the pulpwood industry. However, in both places, people who were not in favour of the industry made up the greatest proportion of those with a well-developed appreciation of the natural environment. In Spring Bay, more highly educated people and newcomers to the municipality were most appreciative of the natural environment and also tended to be less favourable toward the woodchip industry.

The most noticeable differences between communities lay in the attitudes of men, women, and life-time residents. In Esperance, men least favoured the pulpwood industry and in Spring Bay, women were least favourable toward it. Similarly, the opinions of life-time residents were different in each municipality in that these people were less favourable to the industry in Esperance than they were in Spring Bay.

Different factors were also implicated in perceptions of the existence and nature of problems associated with the pulpwood industry; men were more aware of problems than women, especially in Esperance, while those Spring Bay people who were most satisfied with municipal social

activity were also more perceptive of woodchip problems than those for whom the social activity was inadequate.

5.3.2 Pulpwood Industry Attitude Groups

General feelings about the pulpwood industry, as outlined in subsection 5.3.1, provide introductory points of reference. Since the views reported were communicated in unfamiliar interview situations by sometimes defensive respondents, they perhaps represent what could be described as a conservative public response. Doubtless, the problem of how well responses reflect reality is present in all surveys, but particularly so in this case where forest communities have become quite antagonistic toward 'greenies' and rather distrusting of city people for their conservation tendencies. In order to get behind the public front and see something of the private view, a Likert-type attitude scale is used to determine the strength and divergence of attitudes to particular aspects of the industries and the size and composition of groups holding similar attitudes to the pulpwood industry. This scale operates in the same manner as that described in Section 5.1 and complete details of scale construction and attitude items used are given in Appendix E.

As with community attitude groups, pulpwood attitude groups are identified according to dimension scores. Five dimensions of attitude toward the pulpwood industry were selected and used to compare and contrast groups in Esperance and Spring Bay. Each dimension was concerned with effects of the pulpwood industry in a particular area as follows:

(a) the human environment (concerned with new people brought to the municipality by the pulpwood industry, noise and danger associated with log transport, and industry working conditions);

(b) the physical environment (concerned with effects of the

pulpwood industry on the appearance of the forests, the animals and plants, and the long-term future of the forests);

(c) forest management (encompassing matters of wood waste, forest productivity, regeneration, and the activities of the Forestry Commission);

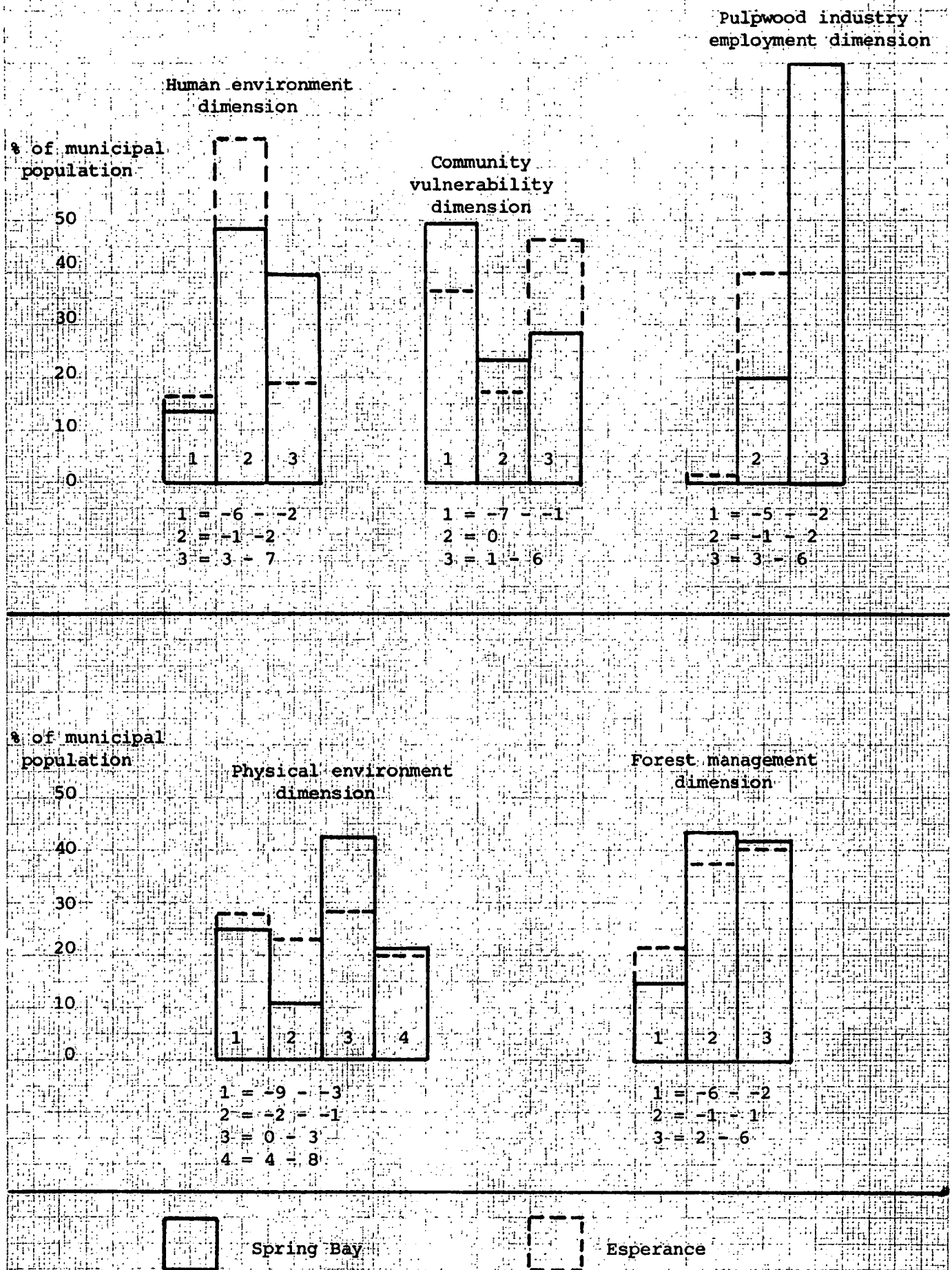
(d) local employment (relating to the importance and nature of pulpwood employment and local employment induced by the industry);

(e) community vulnerability (concerned with the degree of community dependence on the industry and future prospects).

Pulpwood industry attitude dimension groups are represented graphically in Figure 5.3 (these results have been re-weighted to show proportions in the total populations). Noticeable differences in attitude between municipalities were recorded in respect of all dimensions except for that of forest management. In each of these dimensions, except for that of community vulnerability, the Spring Bay community responded more positively, or favourably, toward the industry. In respect of the human environment, a majority of Esperance people adopted a more neutral position while those in Spring Bay were more evenly divided between a neutral position and a quite positive stance. The importance of woodchip employment in Spring Bay was reinforced by the high proportion of people expressing a strong positive view in the employment dimension and, although a majority of Esperance people similarly shared a strongly positive view of woodpulp employment, there was also a considerable proportion with a more reserved attitude. Factors which contributed to this were concern for contractor security, the lack of local repair work, and the fact that many residents had to commute to work out of the municipality. In Esperance, there was considerable

FIGURE 5.3

Pulpwood industry attitude dimension groups for Esperance and Spring Bay



Scores for each dimension have been grouped differently according to apparent trends and the range of scores which are included in each attitude group is shown beneath the histograms.

divergence of opinion regarding effects of the woodpulp industry on the physical environment; similar numbers of people held strongly positive, negative, and neutral views. Although most people expressed a positive, approving attitude toward the effects of the woodchip industry on the physical environment in Spring Bay, there was also a substantial strongly negative response.

Differences between Esperance and Spring Bay in the community vulnerability dimension highlight a split in both communities between those who felt secure in the future of the pulpwood industry in the municipality and those who felt uncertain and less confident. The Esperance community, overall, appeared to consider itself more secure than did the Spring Bay community, which was perceived as being overly dependent on the woodchip mill and in a very vulnerable position. In conversation, it became apparent that people were conscious that much depended on Japanese markets and they also felt threatened by the takeover of TPFH by APPM which was seen as likely to lead to eventual transfer of Triabunna operations to Long Reach. Meanwhile, Esperance people seemed to feel that the 20-year history of pulp-making in the area, coupled with recent investment in a new boiler by APM, pointed toward the long-term security of the woodpulp industry and this, together with the greater effect of other primary industries, convinced many people of the relative economic security of the Esperance community.

Both communities recorded similar attitudes to forest management, although greater concern for waste of wood was reflected in the slightly larger negative attitude group in Esperance. Overall, people in each community were fairly evenly divided between holding a neutral or positive view of forest management in the pulpwood industry.

Pulpwood industry attitude dimension groups, as shown in Figure 5.3, were cross-tabulated with a range of socio-economic variables; a number of these appeared to be related to pulpwood attitude groups, but

only in Spring Bay.

Factors which seemed to affect attitudes toward woodchip industry effects are similar to those which were implicated in attitudes toward different aspects of life in the municipality, and include length of residence in the municipality, age, education, and whether or not a person had spent all their life in the municipality. Length of residence in Spring Bay and age had some influence on people's perception of community vulnerability (Table 5.26).

TABLE 5.26

Spring Bay: Influence of length of residence in municipality on perception of community vulnerability due to the woodchip industry[a]

Length of residence in municipality (years)	Community vulnerability attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
≤ 10	25	58	11	26	7	16
> 10	13	34	7	18	18	47

[a] Un-weighted results from stratified sample.

Those who had lived there prior to commencement of woodchipping, as well as those who had moved in since that time, were divided in opinion. However, people who had arrived after woodchipping began (that is, had lived in the area for less than 10 years) showed a greater sense of community vulnerability. This trend may also be related to age (Table 5.27) since 55% of younger respondents (15-34 years) felt the vulnerability of the community most keenly, and many people of this age group would have moved into the municipality either to work in the industry or in positions which became available after it began. Mid-aged (35-54 years) people appeared most polarized about this aspect of the industry, with over 40% of this age group feeling either very confident and secure or else very insecure. Older people (over 55 years) were

TABLE 5.27

Spring Bay: Influence of age on perception of community vulnerability due to the woodchip industry[a]

Age (years)	Community vulnerability attitude group					
	1(-ve)		2		3(+ve)	
	No.	%	No.	%	No.	%
18-34	22	55	6	15	12	30
35-54	19	45	6	14	17	41
55+	14	41	14	41	6	18

[a] Un-weighted results from stratified sample.

most cautious and this age group had the smallest proportion of people feeling confident in municipal security through the woodchip industry and the largest proportion of people feeling neutrally about this aspect. Figure 5.4 shows a reproduction of an article in the local *East Coast Courier* in March 1982 which conveys some of the feelings of insecurity felt by Spring Bay people.

Two influences on attitudes toward woodchip industry effects on the physical environment in Spring Bay were indicated as being educational attainment and whether or not people had lived all their lives in the municipality. From Tables 5.28 and 5.29, it can be seen that people who had always lived in Spring Bay and those with less education felt more approving of the environmental effects of woodchipping than those who had moved there or had attained a higher level of education. These variables were related in that all higher educated people in Spring Bay were inmigrants to the municipality. Such divisions were not apparent in Esperance where a similar range of views on environmental effects was held by those who had always lived there, as well as people who had moved in. Those with higher education tended to be more disapproving of woodpulp effects but not to a marked degree.

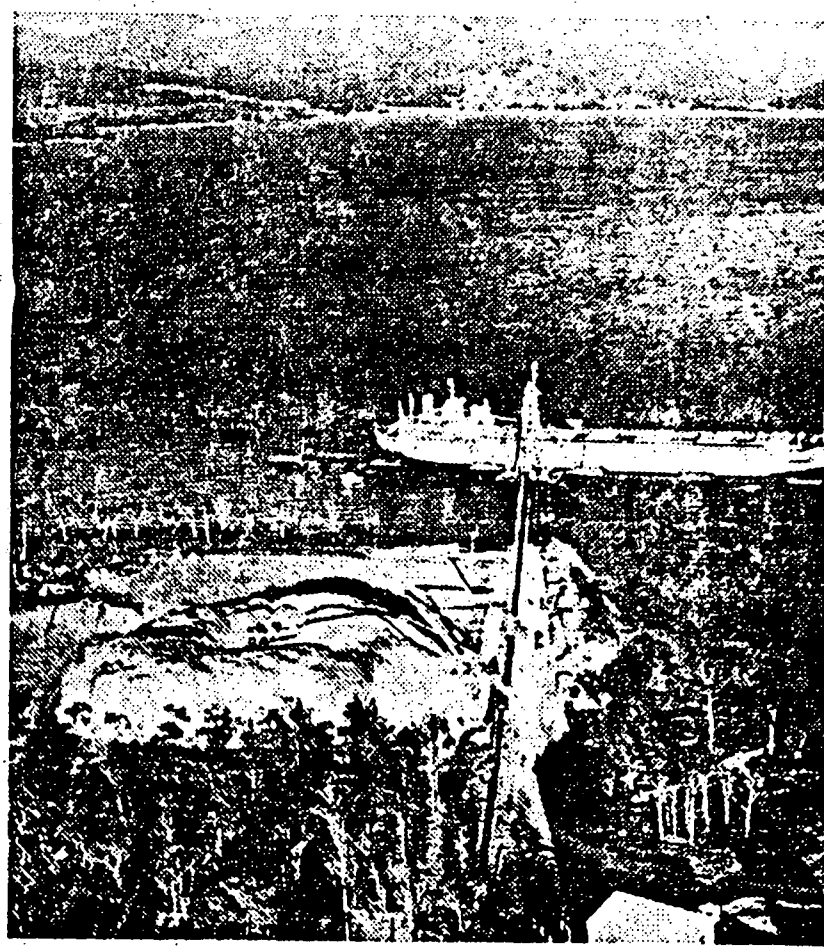
FIGURE 5.4

COURIER

WEDNESDAY, MARCH 17, 1982 VOL. 2 — No. 11

'Consolidation' reason chip mill shutdown

CONSIDERABLE rumor and anxiety has been rife in the community over the past few weeks, and with the full shut-down of the Triabunna woodchip mill the week before last, many people have expressed opinions that their worst fears were true.



Consultation with the management of Tasmanian Pulp and Forest Holdings has given the reason for this shut-down.

We could say that our woodchip mill is too efficient or maybe we should say that we are over-producing.

There is a worldwide slump in the demand for pulp and paper products at the current rate of worldwide production.

This slump has been worsening over the past 12 months or so, and it is thought that the bottom of the trough has been reached.

This is not to say that it is to get better within the immediate future.

The Triabunna mill has its shipping schedule finalised until the mid-year, and two ships are expected within the next fortnight.

The closure of the mill was to allow the company to keep its chip stockpile at a manageable level before the arrival of these ships.

The long weekend for Labor Day was considered to be an ideal opportunity to give families an additional four days' break as part of their annual leave entitlement.

Because there were no workers on the factory site, it was natural that logging operations should be closed for the same period.

The manager of the mill, Mr Keith Henry, said there was no intention at this time for any further closures until the normal shut-down maintenance time over the Christmas holiday period of 1982-83.

He indicated strongly that the whole gambit of the industry was in a recession, and that a total market improvement was necessary for a return to the full production at the Triabunna mill and others to be possible.

There was no need for alarm if the trend in the market indicated the future.

We hope to be able to keep you informed as to trends over future months.

TABLE 5.28

Influence of whether or not people had lived all their lives in Esperance and Spring Bay on attitudes toward the effects of the pulpwood industry on the physical environment[a]

Esperance

Life in the municipality	Physical environment attitude group							
	1(-ve)		2		3		4(+ve)	
	No.	%	No.	%	No.	%	No.	%
Lived in municipality all life	17	26	14	21	18	27	17	26
Only for part of life	15	29	13	25	15	29	8	16

Spring Bay

Life in the municipality	Physical environment attitude group							
	1(-ve)		2		3		4(+ve)	
	No.	%	No.	%	No.	%	No.	%
Lived in municipality all life	2	6	3	9	21	60	9	26
Only for part of life	23	28	10	12	28	35	20	25

[a] Un-weighted results from stratified sample.

Comparison of attitudes to five particular aspects of the pulpwood industry in Esperance and Spring Bay showed distinct differences in opinion of the employment and human and physical environmental effects of each industry. In each of these respects the woodchip industry in Spring Bay was felt to have a more positive effect than the Esperance woodpulp industry. However, the Spring Bay community considered itself less secure than did that of Esperance. Also, in Spring Bay there was greater difference in attitude between some groups: including people who had always lived in the municipality and those who had not, and lower and higher educated people.

TABLE 5.29

Influence of educational attainment on attitudes toward the effects of the pulpwood industry on the physical environment[a]

Esperance

Educational attainment	Physical environment attitude group							
	1(-ve)		2		3		4(+ve)	
	No.	%	No.	%	No.	%	No.	%
Up to Schools' Certificate	26	26	22	22	29	29	24	24
Higher Schools' Certificate & beyond	6	38	5	31	4	25	1	6

Spring Bay

Educational attainment	Physical environment attitude group							
	1(-ve)		2		3		4(+ve)	
	No.	%	No.	%	No.	%	No.	%
Up to School s' Certificate	14	15	12	13	43	46	25	27
Higher School s' Certificate & beyond	11	50	1	5	6	27	4	18

[a] Un-weighted results from stratified sample.

Most differences in attitude in Spring Bay related to the effects of the industry on the physical environment. People who were most approving of the effects included life-time residents and those with lower levels of education. People who had moved to the area and/or were more highly educated were most disapproving. In Spring Bay, those most confident in the security of the woodchip community had been living in the municipality since before woodchipping began, while those who felt least secure were younger people (less than 35 years) and those who had arrived after commencement of the woodchip industry.

5.4 INTEGRATION AND DISCUSSION

This chapter has compared and contrasted attitudes towards the pulpwood industries in Esperance and Spring Bay. The industries are similar in that each is the industrial focus of the municipality, but the Esperance pulp mill has been in operation for twice as long as the Spring Bay woodchip mill and, due to greater development of other primary industries, is not considered as important in terms of local employment and prosperity as the woodchip industry is in Spring Bay. Also, due to the smaller size of the Spring Bay municipality, the woodchip influence is more apparent.

In order to uncover differing views of community life by various groups both within and between the municipalities, and furthermore, to see if such views conflicted with the perceived role of the pulpwood industry in each area, people's attitudes towards their community and area as a place to live were measured. The most prominent differing attitude groups are summarized in Table 5.30. Views common to both municipalities included a high value placed on country life (52% in Esperance and 29% in Spring Bay) and a lack of outright criticism of each area as a place to live (31% in Esperance and 32% in Spring Bay). In each place there were common differences in attitude between people who had always lived in the area and those who had moved there and also between younger and older people. People who had moved in were more likely to have a stronger appreciation of the natural environment while older residents were more satisfied with the level of services and facilities available in the municipality. The main differences involved the relative values of men and women; the comradeship and "togetherness" of the local community was valued most by Esperance men while Spring Bay women also most valued their community. On the other hand Spring Bay men most appreciated the environment (mainly the climate) of the municip-

TABLE 5.30

Main Community Attitude Groups

Attitude	Esperance	Spring Bay
Overall:		
Environment Priority	-	men
Community Priority	men	women
	lower educated people	
	lifetime residents	
Particular Dimension		
+ve environmental	inmigrants	inmigrants
		higher educated people
-ve environmental	life-time residents	life-time residents
		lower educated people
+ve services/facilities	older people	older people
-ve services/facilities	younger people	younger people
+ve community unity	-	life-time residents
-ve community unity		inmigrants

ality and in this respect responded similarly to residents of Eden in New South Wales surveyed by Scott (1975) in a comparative study of people's attitudes to woodchipping in the region. Male-female value differences may have been caused by differing social structures, particularly the influence and differing perspective of new residents moving into Spring Bay. In addition, the declining population of Esperance has maintained the more typically rural nature of the Esperance community

with a tendency to be inward-looking as people became very familiar with other members of the community. Emphasis on the environment by Spring Bay males may also simply be a reflection of the more benign climate experienced on the East Coast. Another major difference between the municipalities was in differences in attitude in Spring Bay between higher and lower educated people and between life-time residents and people who had migrated into the area. These differences between groups were not apparent in Esperance. Once again, the Spring Bay situation seems to reflect the effects of rapid population growth where newcomers felt less at home in the community. Also, a core of well-educated newcomers had brought with them a strong appreciation of the natural environment.

Examination of attitudes toward the pulpwood industry, showed that the Spring Bay community was slightly more in favour of the industry (87%) than was the Esperance community (79%). Once again the findings in Spring Bay strongly correlate with Scott's (1975) survey in Eden, New South Wales. However, industry support was strongest in different sections of each community; Table 5.31 lists the most noticeable groups of people holding similar views of the industry. In Spring Bay men and life-time residents were the most favourable groups while in Esperance newcomers and women tended to be more in favour. Also, life-time residents of Esperance and men were less supportive of the industry than those in Spring Bay. The differing appreciation of the pulpwood industry by life-time residents is significant because in most other respects this group (for both communities) was very similar in attitude. Life-time residents in both Spring Bay and Esperance tended to have a low appreciation of the environment, to be satisfied with the level of community services and facilities provided, and to stress community unity. The difference in attitude toward the pulpwood industry appears to be connected with perceived inadequate benefits flowing to the Esperance community from woodpulping in the area. Throughout the survey many

TABLE 5.31

Main Pulpwood Attitude Groups[a]

Attitude	Esperance	Spring Bay
Overall:		
Most favourable	inmigrants	life-time residents
	women	men
	people least appreciative of the natural environment	people least appreciative of the natural environment
Least favourable	environmentally appreciative people	inmigrants
	life-time residents	women
	men	environmentally appreciative people
Most significant problems	men	people very satisfied with local social activities
		men
Least significant problems	women	people dissatisfied with local social activities
		women
Particular Dimension:		
+ve physical environment		lower educated people
		life-time residents
-ve physical environment		higher educated people
		inmigrants
-ve community vulnerability	-	younger people
		people who have settled since the chip mill established

people pointed out the insufficient level of pulpwood processing; those in the sawmilling industry were very critical, believing the woodpulp industry to be undermining their resource base. As yet, the woodchip industry in Spring Bay has brought mainly population and material growth which were greatly desired, but as limits to this are reached, as they have been in Esperance, the initial enthusiasm for the woodchip industry may wane; life-time residents may view the industry as those in Esperance currently do. Overall, the larger number of differing groups in Spring Bay (Table 5.31) suggests a greater diversity of opinion there than in Esperance and also the greater direct influence of the industry on local people due to the relatively higher number of people dependent on the industry for their livelihood.

Both woodchip and woodpulp industries were supported primarily on employment grounds. Perhaps the most significant result of the survey was the degree of reservation shown about each industry. In all, approximately 56% of the Esperance population and 50% of Spring Bay people considered the respective industries not to be without significant problems. Environmental and forest management problems were cited predominantly, although road damage and danger due to log trucks was of slightly more concern in Spring Bay. People frequently emphasized the continuing anxiety caused to many local residents as well as visitors due to the frequency of log truck traffic in combination with the poor conditions of local roads. In both communities men seemed most aware of industry problems, probably due to greater first-hand knowledge.

Comparing overall community opinions of pulpwood industry effects on the lives and employment of local people as well as on the forest environment, it was found that the people of Spring Bay viewed the industry more favourably than did those of Esperance. The majority of people in both areas were not disapproving of forest management practices used in the industry although there was definitely greater concern in Esperance at the high level of wood wasted in clearfelling operations.

In Spring Bay, again the effect of a population influx was shown by the greater disapproval of the effects of woodchipping on the forest environment by more highly educated people and newcomers to the municipality (there tends to be a large overlap between these last two groups). Younger people in that municipality seemed more concerned about the vulnerability of the community due to the operation of the woodchip industry. Esperance people, as a whole, felt their community to be less vulnerable, a view which has since proved ill-founded.

This comparison of attitudes and opinions of two pulpwood-industry based communities has highlighted some similarities and differences between particular areas as well as raising some major, more general issues. High employment and community dependence on single forest industries were perhaps the most outstanding similarities, in common with other rural forest communities cited in Section 2.1. In fact the parallels between Eden and Triabunna are very close and also Esperance bears some resemblance to the Alpine towns described by Elton (1976), particularly in the strong community identification felt in both areas.

Recognition of the immediacies of employment and community dependence generally over-rode longer-term concerns (which nonetheless are developing) such as possible deleterious environmental consequences of forest logging or management. Instances in which employment benefits were not accorded top priority, or in which significant reservations were held, occurred for at least two reasons; firstly, a general dissatisfaction with the level of employment and other social benefits, and secondly, a wider environmental appreciation.

Due to a differing historical development of forest industries in each area, resulting in a longer experience of the pulpwood industry in Esperance as well as differences in social and demographic population characteristics from those of Spring Bay, disfavour or criticism of the woodpulp industry has largely focussed on the inadequate level of benefits flowing to the community. On the other hand, criticism of the wood-

chip industry in Spring Bay, stemmed from awareness of and concern for, the natural environment.

Thus, although most Spring Bay people felt unsure about the future of woodchipping in their municipality, they felt this was largely dependent on outside forces, and did not detract from their overall support for the actual operation of the industry. In this situation, Esperance experience would suggest the future attitudes toward the woodchip industry in Spring Bay and similar areas will become less favourable because further processing is highly unlikely, while a declining or fluctuating volume of production is more likely to occur. The Spring Bay unemployment rate (7.2%) is presently much lower than that of Esperance and many other rural areas, but may approach these levels as woodchip employee's families grow up and seek work in the industry. The situation for young women is already restricted and is unlikely to expand.

In conclusion, the introduction of the new woodchip industry to the relatively undeveloped East Coast municipality can be seen to have created some new stresses, work patterns, and elites, as has been observed by Smith (1980) of other large forestry projects. Although stresses created by a large influx of new people have lessened since the early years of establishment, looking to the future the opportunity is present for recurring community division over such matters as road use conflicts between log trucks and other traffic. This is particularly so as more people move into the area for reasons other than employment in the woodchip industry.

CHAPTER SIX

CONCLUSIONS

In examining socio-economic aspects of the export woodchip industry in Tasmania the basic approach adopted in this thesis has been to provide a state-wide context and outline for the industry while focussing on regional effects and people's attitudes to those effects at the municipal level. On a state-wide basis, the peripheral nature of the Tasmanian economy (as discussed by Wilde (1980)) and in consequence, its dependence on resource exploitation, has created a situation where the forestry sector has been promoted as a major source of both economic wealth and regional development. However, the manner by which this wealth has been created and the role of forestry in regional development has changed considerably.

Historically, the Tasmanian forest industry was based on a rural-orientated, locally-owned and labour-intensive sawmilling industry which assisted in the development of many local economies. Although sawmilling still fulfills this role to a much smaller extent, it has been largely superseded by a centralized, outside-owned and capital-intensive pulpwood industry, a large component of which consists of providing raw material for pulp and paper production in other Australian states and overseas countries. The shift in emphasis towards paper-related production has given rise to an almost monopolistic control over Crown forests by three companies. This trend has been supported by, and occurred in conjunction with, increased government involvement in the forestry sector. Generous, long-term rights guaranteed by Acts of Parliament over extensive areas of Crown forest have provided a secure base for expansion and further control by one company - APPM. In addition, since the 1950s, the costs of renewing the forests on Crown land, and the provision of industry infrastructure, have been largely borne by the public. As forest industries become increasingly concentrated in fewer hands, public expenditure on forest management

and infrastructure translate into the profits of a few private companies.

From an historical perspective, the export woodchip industry represents a predictable extension of past trends within the forest industries and exemplifies the overall structure of the Tasmanian economy. The lack of further processing of woodchips currently exported and the huge amounts of pulpwood required by the industry, have meant that most of the benefits to be derived from the five-fold increase in pulpwood production since the early 1970s have flowed to overseas countries, particularly Japan. In this sense, effective Japanese control over international pulp and paper markets has reduced Tasmania's position to that of a supplier of cheap raw material and has thus severely restricted the possibility of increased manufacturing and economic activity in the State. In addition to exacerbating Tasmania's peripheral economic position, the Long Reach and Triabunna woodchip operations are a visible example of the consolidation of control over public forests by APPM. This company currently holds exclusive pulpwood rights over two-thirds of Tasmania's commercially viable Crown forests; this was achieved through the acquisition of TPFH in 1979. Most of the pulpwood from the company's Wesley Vale and TPFH concession areas is exported in the form of woodchips. Other areas outside concession boundaries (such as the North West region) are also being made available to APPM's woodchip operations. The company's position and considerable influence have been instrumental in thwarting the stated intentions of the particular legislation covering each pulpwood concession. Both the Wesley Vale and East Coast concessions were nominally granted in order to encourage development of a major pulp and paper industry; this has not occurred in either area. APPM was studying the feasibility of an export woodchip industry using pulpwood from the Wesley Vale concession areas five years before the company constructed a relatively small pulp and paper mill to satisfy

its obligations under the relevant act. In addition, the acquisition of TPFH effectively eliminated any possibility of a pulp and paper industry being established on the East Coast. Clearly, legislative measures apparently intended to gain increased commercial value from Crown forests have failed in their stated goals. It is arguable whether it was *ever* feasible to set up a pulp and paper industry on the East Coast; however, the readiness with which the State Government offered exclusive rights to Crown forests without fully appreciating trends in the world pulp and paper market has meant that pulpwood from the Wesley Vale area is now being exported unprocessed as woodchips. The profitability of APPM's woodchip operations and the high degree of control exercised by the Japanese pulp and paper industry on world markets suggest that the situation is unlikely to change within the foreseeable future.

On a state-wide level, there are about 1300 people employed in logging and hauling of logs to the woodchip mills as well as working in the mills. The 130 or so prime contractors and similar number of cartage contractors throughout the State are often placed under financial stress by fluctuations in the woodchip market. The high costs associated with heavy machinery, particularly repayments to finance companies for leasing arrangements, necessitate a relatively secure source of income; this is not always forthcoming and partially explains the high turnover of cartage contractors within the woodchip industry, particularly in the earlier establishment years. In this way, individual contractors act as a buffer for the woodchip companies; both the number of contractors and the profitability of their operations expand and contract according to market conditions. In doing so they shoulder a considerable amount of the capital risk associated with the woodchip industry.

Using the employment multiplier derived by Edwards (1981) indicates that, in 1981, there were approximately 3750 people dependent on the export woodchip industry for their employment, including indirect employment generated by employee spending. This level of employment represents the most distinctive and important benefit flowing to the Tasmanian community from the woodchip industry; it is, however, a major benefit that must be viewed in perspective.

The 1300 mill workers, contractors, and bushmen involved in the woodchip industry comprise 14% of total employment in the forestry sector which, in turn, has declined by some 2000 jobs since the early 1970s. Despite the loss of employment in this sector, pulpwood production increased five-fold throughout the 1970s due almost solely to the export woodchip industry; in 1981 approximately 68% of the total timber production from Crown forests was exported as woodchips. The sharp rise to prominence of the woodchip industry has meant that, from 1971-1979, the volume of wood cut per forest-based manufacturing employee increased by over 50% while the amount of value-added produced per m^3 of wood cut fell by approximately 35%. In other words, the Tasmanian community is not getting anywhere near the same value for its timber as it received prior to the advent of woodchipping. The likelihood of any significant additional employment being generated is restricted by the fact that it would require a massive increase in output, (given that the industry was operating at full capacity, a $1 million increase in woodchip sales would necessitate an increase of only 8 jobs in the mills and some 78 jobs throughout the State), a possibility that appears very unwise when considering the current over-commitment of Tasmania's forests in terms of sustainable yield (Walker 1981).

In changing the orientation of forest production in Tasmania, the export woodchip industry has redirected the time, efforts and resources of the Forestry Commission towards management of woodchip

concession areas. In addition, the massive increase in pulpwood utilization throughout the State has led to a corresponding increase in usage of Tasmania's transport network as logs are carried by either road or rail from many parts of the State to the often distant woodchip mills. The increased public expenditure associated with infrastructure and services to the woodchip industry has resulted in an annual public subsidy of at least $10 million. Most of this subsidy is attributable to Forestry Commission operations and transport network expenditure for APPM's subsidiaries at Long Reach and Triabunna. Quite clearly timber royalties, road tolls and railway charges are inadequate to cover the associated costs to the public purse. Assuming that such costs should be recovered for services and facilities, this level of public subsidization is an indication of the extent to which the existing system of forest allocation and management allows private companies to profit from the woodchip industry at public expense. A similar conclusion for woodchip operations in other states of Australia was reached by Routley and Routley (1974) and Walter (1976). While the role of the woodchip industry as a regional employer is acknowledged, it would seem prudent to fully assess the economic impact of the industry to provide a comprehensive picture of the costs and benefits, both in Tasmania and Australia as a whole. As yet, no such study has been undertaken and promotion of woodchipping as a source of regional employment must be viewed as inadequate when not placed in a broader economic context as to how much it has cost the community to provide those jobs.

It was the potential of the woodchip industry as a significant employer in depressed rural areas that was stressed prior to establishment of the industry. The comparative study carried out of the municipalities of Esperance and Spring Bay provides added weight to this claim, although the extent of the employment benefits is very dependent on the current regional economic climate and historical factors

influencing the situation. In Esperance, a traditional reliance on an ailing fruit industry and the concurrent collapse of 'box' sawmilling not only meant that local people were seeking employment but also that the necessary forestry-related skills for the new woodpulp industry were readily available within the local community. Apart from an inflow of some administrative and technical staff, employment changes due to establishment of the pulpmill in the area largely occurred within the municipality as jobs were re-distributed. The small size of the Spring Bay labour force and the lack of an historical involvement in the timber industry gave rise to a large increase in forestry-related employment when the woodchip mill was built. Although the bulk of pulpwood industry employment was male-orientated, a significant increase in female employment coincided with the initial establishment period of the industry in both municipalities. The main growth areas in female employment were in the retail sector and community services; the inadequate level of services in Spring Bay to cater for a major population increase resulted in a higher proportional increase in female employment than in Esperance. The extent to which growth in female employment can be attributable to the pulpwood industry is obscured by similar trends occurring right throughout Australia.

The differential impact of the pulpwood industry is reflected in the fact that up to 40% of the Spring Bay labour force may be directly and indirectly dependent on woodchipping while the corresponding figure for dependence on the woodpulp industry in Esperance is 20%.

In changing labour force trends at the regional level, the woodchip industry has created new social relations and demographic trends within those communities most affected. From the comparative study of Esperance and Spring Bay, it is evident that the most appreciable changes occur in local communities where a readily avail-

able work force and appropriate expertise are lacking. The influx of woodchip employees into Spring Bay helped expand and stabilize the age structure of the community, as well as providing a more balanced sex ratio. Expansion of the population occurred largely in the middle age bracket and it was this group that proved the more outward-looking and dynamic element in Spring Bay. Such a development was not evident in Esperance where the woodpulp industry had only a minor impact on demographic characteristics; since the mid-1960s the Esperance population has decreased markedly through out-migration as the fruit and sawmilling industries continue to decline. This basic difference between the two communities showed up quite strongly in community attitudes toward the pulpwood industry. Nonetheless there were considerable overlaps. Throughout Tasmania the lack of job opportunities in general, due to the emphasis on primary industry and extractive, often energy-intensive industries, has meant that people are very supportive of almost any activity which generates employment. Correspondingly, a high level of community support was accorded to the pulpwood industry in both communities surveyed; 78% of those interviewed were favourable towards the industry in Esperance while 90% were favourable in Spring Bay. Despite this amount of support, there were considerable reservations held about the industry; approximately half of those surveyed in each area considered that there were major problems associated with the pulpwood industry, foremost of which were environmental and forest management concerns.

Support and criticism of the industry came from different groups in each community. The aforementioned influential group of newcomers to Spring Bay tended to have a well-developed appreciation of the natural environment; it is from the higher educated ranks of this group that most criticism of woodchipping was forthcoming. Life-time residents, having a low appreciation of the environment and viewing

the woodchip industry as beneficial in its impact on the environment, were the most favourable towards the industry. This latter group tended to have a different perspective in Esperance, where general dissatisfaction with the level of benefits flowing to the community has resulted in criticism of the pulpwood industry by a significant number of life-time residents. It may be some years before similar dissatisfaction amongst life-time residents is registered in Spring Bay. Overall, the lack of any major demographic impact by the pulpwood industry in Esperance has left unaltered the inward-looking nature of the community. Emphasis was placed on community cohesion, a factor that was not evident in Spring Bay.

Although given strong support on employment grounds, the pulpwood industry tended to be viewed differently by various groups within those communities examined. Differences in attitude appeared to be closely connected with length of residence, sex, educational standard, and regard for the environment. As population dynamics change in areas effected by woodchipping, such factors can be expected to influence community attitudes towards the industry. For example, in the case of Spring Bay, a continuing increase in the number of people retiring to the municipality (as well as tourists travelling through it) can be expected to lead to further criticism of woodchipping in the district.

There are no simple explanations for the complexities involved in the socio-economic changes brought about by the export woodchip industry. Nor are there any simple solutions to the problems that may be created by its impact. Nonetheless the Tasmanian community is always in a position to ask whether it is maximizing the potential benefits to be gained from heavy utilization of its forests. Certainly the benefits are identifiable: 3750 people employed statewide and a significant contributor to regional economies. But at the same time harvesting of Crown timber has increased five-fold

since woodchipping began and the public contributes at least $10 million annually to provide infrastructure for the industry. Furthermore, the monopoly over Crown forests by APPM has been further consolidated; the dangers of the trend towards single company control over extensive areas of forest for a long period have been amplified by closure of the APM pulpmill at Port Huon in late 1982.

The question as to whether Tasmanians are receiving adequate recompense for private harvesting of Crown forests has been answered negatively by various reports commissioned by the State Government (Sinclair 1979; Young 1976). The results of this thesis suggest that much more thought and analysis needs to be given to ways of using the forest resource, particularly with respect to the export of woodchips, before Tasmania can be satisfied that its interests are being adequately promoted.

REFERENCES

ASSOCIATED PULP AND PAPER MILLS LTD, 1976; *Annual Report 1976;* Associated Pulp and Paper Mills Ltd, Melbourne.

ASSOCIATED PULP AND PAPER MILLS LTD, 1981; *Annual Report 1980/81;* Associated Pulp and Paper Mills Ltd, Melbourne.

ASSOCIATED PULP AND PAPER MILLS LTD, 1981a; Wesley Vale ten years on. Where to in the next ten years, *In Touch* 5(11), 24.

ASSOCIATED PULP AND PAPER MILLS LTD, 1982; We host APPITA conference in Launceston, *In Touch* 6, 4-6.

AUSTRALIA, FEDERAL PARLIAMENT, 1977; *Woodchips and the Environment;* Report from the Senate Standing Committee on Science and the Environment, Australian Government Publishing Service, Canberra.

AUSTRALIAN BUREAU OF STATISTICS, 1954-1976; *Census of the Commonwealth of Australia - Population in Local Government Areas 1954-1976;* Australian Bureau of Statistics, Tasmanian Office, Hobart. Up until 1974 the Australian Bureau of Statistics was known as the Commonwealth Bureau of Census and Statistics.

AUSTRALIAN BUREAU OF STATISTICS, 1971-1981; *Livestock Statistics 1971-1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1978; *Census of Manufacturing Establishments 1976-1977;* No. 6202.6; Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1980; *Agricultural Industry 1955-1980;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1981; *Australian Year Book;* Commonwealth Printing Office, Canberra.

AUSTRALIAN BUREAU OF STATISTICS, 1981a; *Census of Manufacturing Establishments 1979-1980,* No. 8202.6; Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1981b; *Labour, Wages and Prices Tasmania 1980-81,* No. 6101.6; Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1981c; *Tasmanian Year Book 1981;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1981d; *State and Local Government Finances Australia 1979-80,* No. 5504.0; Australian Bureau of Statistics, Canberra.

AUSTRALIAN BUREAU OF STATISTICS, 1982; *Sawmilling, Woodchipping etc. Statistics - Tasmania March Quarter 1982,* No. 8203.6; Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN BUREAU OF STATISTICS, 1982a; *1981 Census of Population and Housing;* Australian Bureau of Statistics, Tasmanian Office, Hobart.

AUSTRALIAN PAPER MANUFACTURERS, 1975; *Port Huon Mill;* Australian Paper Manufacturers, Melbourne.

BEHRENS, N., O'GRADY, J., HODGSON, S., HOULT, P., and HUGHES, A., 1978; *The Huon Valley Study;* Education Department of Tasmania, Hobart.

BENNET, A.J., HUDSON, K.E., and NIEUWHOF, F.W.N., 1971; *Report to the Municipal Association on the Effects of Woodchip Traffic on the Municipal Road System;* Municipal Association, Tasmania.

BERTRAND, A.L., 1978; Rural social organizational implications of technology and industry; in FORD, T.R. (ed.), 1978; *Rural U.S.A. Persistence and Change;* Ames - Iowa State University Press.

CALLAGHAN, SIR BEDE, 1977; *Inquiry into the Structure of Industry and the Employment Situation in Tasmania;* Australian Government Publishing Service, Canberra.

CHAPPLE, D.L., 1976; *Tokoroa: Creating a Community;* Longman Paul, Auckland.

COLLINS, J.T., DONNELLY, P.T., and FRANCIS, M., 1977; Reply to: Some comments on forest planning and the Forestry Department Plan for Otago, *New Zealand Journal of Forestry* 22(1), 134-9.

COMMONWEALTH BUREAU OF CENSUS AND STATISTICS, 1912; *Statistics of the State of Tasmania for the Year 1911-12;* Commonwealth Bureau of Census and Statistics, Tasmanian Office, Hobart.

COMMONWEALTH BUREAU OF CENSUS AND STATISTICS, 1929; *Statistics of the State of Tasmania for the Year 1929-30;* Commonwealth Bureau of Census and Statistics, Tasmanian Office, Hobart.

COMMONWEALTH BUREAU OF CENSUS AND STATISTICS, 1932; *Statistics of the State of Tasmania for the Year 1932-33;* Commonwealth Bureau of Census and Statistics, Tasmanian Office, Hobart.

COMMONWEALTH BUREAU OF CENSUS AND STATISTICS, 1955-1975; *Statistics of the State of Tasmania for the Years 1955-1975;* Commonwealth Bureau of Census and Statistics, Tasmanian Office, Hobart. The Bureau had in fact changed its name to Australian Bureau of Statistics in 1974. Since the early 1970s state-wide statistics have been published in A.B.S. Yearbooks.

COMMONWEALTH BUREAU OF CENSUS AND STATISTICS, 1968; *Compendium of Municipal Statistics 1968;* Commonwealth Bureau of Census and Statistics, Tasmanian Office, Hobart.

CROMER, D.A.N. *et al.*, 1975; *Economic and Environmental Aspects of the Export Hardwood Woodchip Industry,* Report of a Working Group, April 1975, Volume 1; Australian Government Publishing Service, Canberra.

CUTHBERTSON, A.G., STOECKEL, A.B., and KREITALS, J.E., 1974; *Income Levels and Adjustment Patterns in a Rural Community: Huon Valley Tasmania;* Australian Government Publishing Service, Canberra.

DARGAVEL, J., 1980a; *Opportunities for Whom?;* paper presented at the Institute of Foresters of Australia (Tasmanian Division) Seminar, Opportunities for Investment in Plantations, Hobart 26 July 1980.

DARGAVEL, J., 1980b; *Creating and Destroying Jobs in the Forest Products Industries;* Seminar paper presented to Department of Forestry, Australian National University, Canberra, 22 October 1980.

DAVIES, R.J., JABLONSKA, K.A., and McCUAIG, M.A., 1980; *Employment and Energy Use: the Effects of Hydro-Industrialization in Tasmania 1969-1979;* Project Report 1980/3; Centre for Environmental Studies, University of Tasmania, Hobart.

DAVIES, R.J., 1982; *Domestic Firewood Supply From Near Urban Land;* Masters Thesis, Centre for Environmental Studies, University of Tasmania, Hobart.

DAVIS, B.W., 1975; The political economy of expediency: Tasmania's Bell Bay railway project, *Public Administration* 34(3), 242-57.

DAVIS, B.W., 1981; The economic development of Tasmania: A current perspective, in: MATTHEWS, R.L. (ed.), *Regional Disparities and Economic Development;* Centre for Research on Federal Financial Relations, Australian National University, Canberra.

DELL, A.R., 1968; *The Development of Agricultural Specialization in the Huonville District, 1840-1967;* B.A. Hons. Thesis, Geography Department, University of Tasmania, Hobart.

DOUGLAS, J., 1977; *Log Haulage Industry - Spring Bay;* Unpublished Report, Environmental Design, Tasmanian College of Advanced Education, Hobart.

EDWARDS, G.C. *et al.*, 1981; *A 1977-78 Based Input-Output Model of the Tasmanian Economy;* Centre for Regional Economic Analysis, University of Tasmania, Hobart.

ELTON, H.D., 1976; *Socio-economic Study of the Timber Industry in the Alpine Area,* Report to the Forests Industries Resource Management Group; P.A. Management Consultants Pty Ltd, Melbourne.

EVERETT, M.G. and GENTLE, S.W., 1977; *Report of the Board of Inquiry into Private Forestry Development in Tasmania;* Government Printer, Hobart.

FERGUSON, I.S., 1972; Woodchips and regional development, *Australian Forestry* 36(1), 15-23.

FLETCHER TIMBER COMPANY, 1975; *Tairua and other state forests; proposals for wood purchase,* in: GRANT, R.K., 1976; Local employment multipliers for the pulp and paper industry in New Zealand, *New Zealand Journal of Forestry* 6(1), 122-130.

FLORENCE, R.G., 1977; Resource use conflict in the Victorian Alps, *Australian Forestry* 40(1), 6-12.

FRASER, T. and HORGAN, G.P., 1978; Further comment on the Forest Development Plan for Otago, *New Zealand Journal of Forestry* 23(1), 49-63.

FUGUITT, G., 1971; The places left behind: population trends and policy for rural America, *Rural Sociology* 36, 449-470.

GARDNER, R.K., 1977; *New Landholder in the Huon: Their Effect on Land Use and the Community;* Honours Thesis, Geography Department, University of Tasmania, Hobart.

GARTON, M., 1981; *The East Gippsland Woodchip Surveys: Two Surveys to discover the attutides of visitors and local business people in East Gippsland to the proposed woodchip industry;* Native Forests Action Council, Melbourne.

GILBERT, J.M. and CUNNINGHAM, T.M., 1972; Regeneration of harvested forests, *Appita* 26(1), 43-45.

GOODHAND, W.E., 1961; *Pome Fruit Orcharding in Tasmania: Its Evolution and Present Geographic Basis;* Masters Thesis, Geography Department, University of Tasmania, Hobart.

GRANT, R.K., 1976; Local employment multipliers for the pulp and paper industry in New Zealand, *New Zealand Journal of Forestry* 6(1), 122-130.

GRANT, R.K., 1977; Some comments on forest planning and the Forestry Development Plan for Otago, *New Zealand Journal of Forestry* 22(1), 126-133.

GRANT, R.K., 1979; Managing the regional impact of forest development programmes, *New Zealand Journal of Forestry* 24, 198-204.

GREGERSON, H.M., 1973; The role of forestry in regional development: an alternative view, *Journal of Forestry* 71, 98-99.

GREIG, M.A., 1971; The regional income and employment multiplier effects of a pulpmill and a paper mill, *Scottish Journal of Political Economy* 18(1), 31-48.

GREIG, P.J., 1979a; Some social and economic consequences of intensive forestry, *Australian Forestry* 42(4), 207-214.

GREIG, P.J., 1979b; Employment coefficients for forestry planning and management, *Australian Forestry* 42(3), 181-189.

H.C. SLEIGH LTD, 1981; *Annual Report 1980/81;* H.C. Sleigh Ltd, Melbourne.

HANKE, S. and ANWYLL, J.B., 1980; On the discount rate controversy, *Public Policy* 28(2), 178-183.

HARTLEY, M. and TODD, J.J., 1979; *Energy Use in Tasmania, Energy Statistics 1950-1979;* Centre for Environmental Studies, University of Tasmania, Hobart.

HARTWELL, R.M., 1954; *The Economic Development of Van Diemans Land, 1820-1850;* Melbourne University Press, Melbourne.

HAWES, M., 1981; *Forests and the Forestry Industries in Tasmania;* Tasmanian Wilderness Society, Hobart.

HIGGINS, H.G. and PHILLIPS, F.H., 1973; Technical and economic factors in the export of woodchips from Australia and Papua New Guinea, *Australian Forest Industries Journal* 39(2), 31-43.

HIGHAM, J.R.S., MENZIES, P., and RUSH, B., 1977; *Indigenous Forestry in Western Southland;* Business Development Centre, University of Otago.

HOYSTED, P.A., 1981; *The Content and Historical Development of Forestry Legislation in Tasmania,* Project Report 1981/3; Centre for Environmental Studies, University of Tasmania, Hobart.

HUNTER VALLEY RESEARCH FOUNDATION, 1980; *The Effects of Increasing Costs of Energy on Major Industrial Power Users and the Impact on the Tasmanian Economy;* Report submitted by the Chamber of Industries to the Co-ordination Committee on Future Power Development, Hobart.

HYDRO-ELECTRIC COMMISSION, 1979; *Report on the Gordon River Power Development Stage II,* Appendix II, The Forecast Load; Hydro-Electric Commission, Hobart.

J. WALCH AND SONS, 1980; *The Tasmanian Almanac 1979-80;* Mercury-Walch, Moonah.

JAMES, L., 1981; *Tasmania's Pulp and Paper Companies;* Unpublished Essay, Centre for Environmental Studies, University of Tasmania, Hobart.

JONES, R. (ed.), 1975; *The Vanishing Forests Woodchip Production and the Public Interest in Tasmania;* Environmental Law Reform Group, University of Tasmania, Hobart.

KABLE, J.C., 1981a; *The Social and Economic Impact of the Washpool Timber Resource;* Associated Country Sawmillers of New South Wales, Sydney.

KABLE, J.C., 1981b; *The Socio-economic Effects on Casino of the Closure of the Washpool State Forest to Logging;* Associated Country Sawmillers of New South Wales, Sydney.

KELLOW, A.J., (unpublished); *The Outcome of the Policy Allowing Woodchipping in Tasmania: an Estimate of Social Costs and Benefits;* Centre for Environmental Studies, University of Tasmania, Hobart.

KEMP, A.G., 1981; *History and Development of the Exclusive Forest Permit and Licensing System;* Paper presented at the Institute of Foresters of Australia seminar: Allocating the Forest Resource, 20 June 1981, Hobart.

KENNEDY, I.R. and LODGE, J.J., 1976; *Gembrook State Forest - A Case Study in Multiple Use Management;* Forests Commission of Victoria, Melbourne.

KIRKPATRICK, J.B. and DICKINSON, K.J.M., 1982; Recent destruction of natural vegetation in Tasmania, *Search* 13(7-8), 186-188.

KROMM, D.E., 1972; Limitations on the role of forestry in regional economic development, *Journal of Forestry* 70(10), 630-633.

LEA, J.P. and ZEHNER, R.B., 1982; *The Planning of Resource-Based Communities in Australia: Identifying the Issues;* Paper presented at the 52nd ANZAAS Conference; Macquarie University, New South Wales, 11 May 1982.

LEMBKE, C.A., 1972; TPFH - world's largest woodchip export project, *Australian Timber Journal* 38(1), 11-32.

LEMBKE, C.A., 1973; The world's largest woodchip export operation, *Australian Forest Industries Journal* 39(1), 10-32.

LEMBKE, C.A., 1973a; Unique features in northern woodchips operation, *Australian Forest Industries Journal* 39(3), 16-25.

LIKERT, R., 1932; *A technique for the measurement of attitudes;* Archives of Psychology, No. 140, Columbia University Press.

MARTIN, J., 1968; *John Donnellan Balfe and the Collective Experience of the Huon, 1850-1858;* Honours Thesis, History Department, University of Tasmania, Hobart.

McCUAIG, M.A., 1981; *The Roots of the Woodchip Industry in Tasmania: A Case Study of the Formation of Tasmanian Pulp and Forest Holdings Pty Ltd,* Project Report 1981/2; Centre for Environmental Studies, University of Tasmania, Hobart.

McCUAIG, M.A., 1981a; *Resource Development in the Spring Bay Municipality 1955-1975;* Unpublished Essay, Centre for Environmental Studies, University of Tasmania, Hobart.

McMURRAY, S., 1982; *The Processes and Effects of the Allocation of Tasmania's Forest Resource;* Unpublished Essay, Centre for Environmental Studies, University of Tasmania, Hobart.

MEADOWS, W.G.H., 1981; *History and Development of the Pulpwood Concession System;* Paper presented at Institute of Foresters of Australia seminar: Allocating the Forest Resource, 20 June 1981, Hobart.

MOSER, C.A., 1958; *Survey Methods in Social Investigation,* Heinemann, London.

NEW ZEALAND, NEW ZEALAND FOREST SERVICE, 1975; *Forestry Development Plan for Otago Planning District;* Government Printer, Wellington.

PARK, E. and SPEARMAN, J., 1980; People pressures: it takes more than jobs to satisfy a "work force", *Environment Views* 3(4), 21-25.

PATTERSON, I.G., KIRKHAM, D.O., and GILMORE, K.C., 1978; *The Changing Rural Environment: A Study of Rural Retreats, New Life Styles and Land Use in Southern Tasmania,* Environmental Studies Occasional Paper No. 6; Centre for Environmental Studies, University of Tasmania, Hobart.

QUICK, J.R. (undated); *Private Forestry - the Tasmanian Scene;* internal Forestry Commission notes.

RAIT, B.W., 1960; *The Story of Spring Bay 1860-1960;* Folder of loose typed notes, Tasmanian Collection, State Library, Hobart.

RAIT, B.W., 1976; *Romance of Esperance;* Souvenir programme for festival celebrating 125 years of history in Esperance municipality, January 3-10 1976.

REID, O., 1978; *The East Coast;* Curriculum Centre, Education Department of Tasmania, Hobart.

REILLY, J.J., 1974; Impact of softwood plantations on rural economic development in Australia, *Australian Forestry* 37, 142-152.

ROBERGE, R.A., 1977; Resource towns: the pulp and paper communities, *Canadian Geographical Journal* 94, 28-35.

ROUTLEY, R. and ROUTLEY, V., 1974; *The Fight for the Forests;* Research School of Social Sciences, Australian National University, Canberra.

ROW, M., 1977; *The Tasmanian Timber Trade, 1830-1930: A Case Study in Spatial Interaction;* Masters Thesis, Geography Department, University of Tasmania, Hobart.

ROW, M., 1980; *A Tale of Resource Development;* Tasmanian Historial Research Association Papers and Proceedings 27(3).

SARTORIUS, P. and HENLE, H., 1968; *Forestry and Economic Development;* Praeger, New York.

SCHWARZWELLER, H.K., 1979; Migration and the changing rural scene, *Rural Sociology* 44(1), 7-23.

SCOTT, W.D. and CO. PTY LTD, 1975; *A Study of the Environmental, Economic and Sociological Consequences of the Woodchip Operations in Eden, N.S.W.;* Report prepared for Harris-Daishowa (Australia) Pty Ltd, Sydney.

SINCLAIR,R., 1979; See end of references.

SMITH, B., 1980; *Forestry and Rural Social Change,* Background paper for the Land Use Advisory Council Seminar on Rural Depopulation and Resettlement; University of Canterbury, 24-26 May 1980.

SMITH, B.N.P. and WILSON, P.A., 1980; *Rural Attitudes and Sector Growth: A Case Study,* Paper presented to the New Zealand Sociological Association Conference; University of Waikato, Hamilton, 21-22 November 1980.

STATE STRATEGY PLAN, 1975; *Tasmania's Labour Force,* Working Paper No. 5; Tasmanian State Strategy Plan, Hobart.

STEPHENSON, J., 1981; *People and Pines: the Other Path;* Ecumenical Secretariat on Development, Auckland.

STEVENSON, G., 1976; *Mineral Resources and Australian Federalism,* Research Monograph No. 17; Centre for Research on Federal Financial Relations, Australian National University, Canberra.

TAPLIN, J.H.E., 1981; *Pricing Tasmania's Roads;* Transport Economics Centre, University of Tasmania, Hobart.

TAPLIN, R.E. and TIGHE, P.J., 1982; *The Implications of Uneven Australian Resource Development for Tasmania*, Environmental Studies Occasional Paper 14; Centre for Environmental Studies, University of Tasmania, Hobart.

TASMANIA, AUSTRALIAN BUREAU OF STATISTICS, 1981; *Tasmanian Year Book;* Government Printer, Hobart.

TASMANIA, FORESTRY COMMISSION, 1968; *Annual Report 1967-68;* Government Printer, Hobart.

TASMANIA, FORESTRY COMMISSION, 1972; *Working Plan for the Forested Crown Lands in Eastern and Central Tasmania;* Government Printer, Hobart.

TASMANIA, FORESTRY COMMISSION, 1974; *Working Plan for the State Forests in Southern Tasmania;* Government Printer, Hobart.

TASMANIA, FORESTRY COMMISSION, 1975; *Submission to the Senate Standing Committee on Social Environment - the Impact on the Australian Environment of the Current Woodchip Industry Programme,* Appendix I; Government Printer, Hobart.

TASMANIA, FORESTRY COMMISSION, 1978; *Financial Analysis - Forestry Commission Operations in Concession of T.P. & F.H.;* Government Printer, Hobart.

TASMANIA, FORESTRY COMMISSION, 1981; *Annual Report 1979/80;* Government Printer, Hobart.

TASMANIA, FORESTRY COMMISSION, 1982; *Annual Report 1980/81;* Government Printer, Hobart.

TASMANIA, FORESTRY DEPARTMENT, 1928; *Forestry Handbook 1928;* Government Printer, Hobart.

TASMANIA, NATIONAL PARKS AND WILDLIFE SERVICE, 1976; *Annual Report 1974-75;* Government Printer, Hobart.

TASMANIA, NATIONAL PARKS AND WILDLIFE SERVICE, 1981; *Annual Report 1979-80;* Government Printer, Hobart.

TASMANIA, PARLIAMENTARY STANDING COMMITTEE OF PUBLIC ACCOUNTS, 1973; *Bell Bay Railway and Associated Works,* Report of the Parliamentary Standing Committee of Public Accounts; Government Printer, Hobart.

TASMANIA, STATE GOVERNMENT, 1979; *Submission by the Government of Tasmania to the Senate Standing Committee on Trade and Commerce Inquiry: Forestry and Forest-Based Industries;* Government of Tasmania, Hobart.

TASMANIA, STATE GOVERNMENT, 1980; *Submission to the Industries Assistance Commission Inquiry into Wood and Articles of Wood;* Government of Tasmania, Hobart.

TASMANIA, STATE PARLIAMENT, 1977; *Associated Pulp and Paper Mills Act 1936;* Government Printer, Hobart.

TASMANIAN PULP AND FOREST HOLDINGS LTD, 1971; *Chairman's Address;* Fifth Annual General Meeting 1971.

TASMANIAN PULP AND FOREST HOLDINGS LTD, 1976; *Chairman's Address;* Tenth Annual General Meeting, October 22 1976.

TASMANIAN TIMBER ASSOCIATION, 1981; *Annual Report 1980/81;* Tasmanian Timber Association, Launceston.

TASMANIAN TIMBER ASSOCIATION, 1982; Submission to Hon, K.E. Newman M.H.R. and Hon. W.M. Hodgman, M.H.R.

TRANSPORT POLICY UNIT, 1981; *Transport of Logs Study,* TPU Report No. 4; Transport Commission, Hobart(unpublished).

WALKER, B.B., 1981; *Opting for Wood Production;* Paper presented at the Institute of Foresters of Australia seminar: Allocating the Forest Resource, 20 June 1981, Hobart.

WALLACE, M.J., 1974; *The Theory of Royalty Determination in the Tasmanian Woodchip Industry;* B.Ec. Honours Thesis, University of Tasmania, Hobart.

WALTER, T.S., 1976; *Some Cost-Benefit Aspects of Wood Chipping in Western Australia;* Report commissioned by the South-West Forests Defence Foundation, Nedlands, W.A.

WEST, G.R. and JENSEN, R.C., 1980; Some reflections on Input Output Multipliers, *The Annals of Regional Science,* July 1980.

WESTOBY, J.C., 1962; Forest industries in the attack on underdevelopment, *Unasylva* 16(4), 168-201.

WILDE, P.D., 1980; *Industrial Structure and Change in Tasmania,* Occasional Paper No. 7; Geography Department, University of Tasmania, Hobart.

YOUNG, D., 1976; *An Appraisal of the Prospects for Tasmania's Economic Future,* Consultant's Report No. 3; Tasmanian State Strategy Plan, Hobart.

SINCLAIR, R. 1979; *Tasmanian Wood Skills Resource Investigation;* Department of Industrial Development, Hobart.

APPENDICES

APPENDIX A

AUSTRALIAN STANDARD INDUSTRIAL CLASSIFICATION OF FOREST-BASED INDUSTRIES

Selected pages reproduced from:

AUSTRALIA, AUSTRALIAN BUREAU OF STATISTICS, 1978; *ASIC Australian Standard Industrial Classification, Volume 1: The Classification;* Australian Bureau of Statistics, Canberra.

Australian Standard Industrial Classification : Detailed Classification

DIVISION A : AGRICULTURE, FORESTRY, FISHING AND HUNTING - contd

SUBDIVISION 03 : FORESTRY AND LOGGING

Group	Class	Title and Description
030		FORESTRY AND LOGGING
	0303	LOGGING

This class consists of establishments mainly engaged in felling trees, or hewing or rough shaping mine timbers, posts, railway sleepers, etc.

EXCLUSIONS/REFERENCES: Establishments mainly engaged in transporting logs to sawmills are included in Class 5105.

Primary Activities

- Firewood cutting (forest)
- Logging
- Mine timbers hewing (forest)
- Posts shaping (forest)
- Railway sleepers hewing (forest)
- Timber felling
- Tree felling

0304 FORESTRY AND SERVICES TO FORESTRY

This class consists of establishments mainly engaged in the operation, maintenance or protection (except the provision of fire-fighting services) of forests or forest plantations, in afforestation, in gathering forest products (except logs), in operating forest nurseries or in providing forestry services.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in logging operations are included in Class 0303; and (b) in providing bush or forest fire-fighting services are included in Class 8494.

Primary Activities

- Afforestation
- Bark gathering
- Eucalyptus leaf gathering
- Eucalyptus oil distilling (forest)
- Forest maintenance
- Forest nursery operation
- Forest plantation maintenance
- Forest products gathering (except logs)
- Forestry services
- Gum gathering
- Insect extermination service (forestry; except aerial)
- Leaf gathering
- Nursery, forest, operation
- Pest extermination service (forestry; except aerial)
- Pine plantation maintenance
- Reafforestation
- Timber tracts maintenance

Group	Class	Title and Description

253 WOOD AND WOOD PRODUCTS

2531 LOG SAWMILLING

This class consists of establishments mainly engaged in producing rough sawn timber, sleepers, palings, scantlings, etc, resawn timber from logs sawn at the same establishment, or softwood (coniferous) woodchips. This class also includes establishments mainly engaged in chemically preserving timber.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in hewing or rough shaping mine timbers, posts, railway sleepers, etc, or cutting firewood in forests are included in Class 0303; (b) in kiln drying or seasoning timber are included in Class 2532; (c) in manufacturing hardwood woodchips are included in Class 2537; (d) in producing timber shingles are included in Class 2538; and (e) in both cutting and retailing firewood are included in Class 4897.

Primary Activities

Bark, ground, mfg
Firewood, sawn, mfg n.e.c.
Mine props, sawn timber, mfg
Palings, sawn timber, mfg
Scantlings mfg
Shooks mfg (for containers)
Sleepers, sawn timber, mfg
Timber preserving (except kiln drying or seasoning)
Timber, resawn, mfg (from logs sawn at the same establishment)
Timber, rough sawn, mfg
Woodchips, softwood, mfg (coniferous)

2532 RESAWN AND DRESSED TIMBER

This class consists of establishments mainly engaged in producing dressed timber such as floorboards, weatherboards or mouldings, or resawn timber from timber already sawn at other establishments, or in kiln drying or seasoning timber.

EXCLUSIONS/REFERENCES: Establishments mainly engaged in chemically preserving timber are included in Class 2531.

Australian Standard Industrial Classification : Detailed Classification

DIVISION C : MANUFACTURING - contd

SUBDIVISION 25 : WOOD, WOOD PRODUCTS AND FURNITURE - contd

Group	Class	Title and Description
253		WOOD AND WOOD PRODUCTS - contd
	2532	RESAWN AND DRESSED TIMBER - contd

Primary Activities

Architraves, dressed timber, mfg
Building timber, dressed, mfg
Floorboards, dressed timber, mfg
Kiln dried timber mfg
Mouldings, timber, mfg
Seasoned timber mfg
Skirtings, dressed timber, mfg
Timber, dressed, kiln dried or seasoned, mfg
Timber, resawn, mfg (from timber sawn at other establishments)
Weatherboards, dressed timber, mfg

2533 VENEERS AND MANUFACTURED BOARDS OF WOOD

This class consists of establishments mainly engaged in manufacturing plywood, veneers, particle boards, chip boards or other manufactured boards of wood, or laminations of timber and non-timber materials (including decorative plastic laminates on boards or other substrates).

Primary Activities

Case plywood mfg
Chip boards mfg
Cores, plywood or veneer mill, mfg
Corestock mfg
Decorative plastic laminates on boards or other substrates mfg
Hardboards mfg
Manufactured boards, wooden, mfg
Particle boards mfg
Plywood mfg
Resin-bonded boards mfg (of wood chips, wood particles, wood wool or sawdust)
Rotary veneers mfg
Sliced veneers mfg
Softboards mfg
Veneer or veneer sheets, wooden, mfg

2534 WOODEN DOORS

This class consists of establishments mainly engaged in manufacturing wooden or wooden framed doors (except small cupboard type doors, door-window units or firedoors).

Australian Standard Industrial Classification : Detailed Classification

DIVISION C : MANUFACTURING - contd

SUBDIVISION 25 : WOOD, WOOD PRODUCTS AND FURNITURE - contd

Group	Class	Title and Description
253		WOOD AND WOOD PRODUCTS - contd
	2534	WOODEN DOORS - contd

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing corestock (for sale or transfer out as such) are included in Class 2533; (b) in manufacturing wooden doors of the small cupboard type, wooden window frames, door-window units or gates are included in Class 2535; and (c) in manufacturing or installing firedoors are included in Class 3143.

Primary Activities

Concertina doors, wooden or wooden framed, mfg
Doors, wooden or wooden framed, mfg (except small cupboard type or firedoors)
Louvre doors, wooden, mfg (except small cupboard type)
Screen doors, wooden or wooden framed, mfg
Tilting doors, wooden or wooden framed, mfg
Wooden or wooden framed doors, glazed or partly glazed, mfg (except small cupboard type)

2535 WOODEN STRUCTURAL FITTINGS AND JOINERY N.E.C.

This class consists of establishments mainly engaged in manufacturing wooden structural fittings, prefabricated wooden building components (including custom made built-in furniture), prefabricated wooden or timber buildings, assembled windows, shop fronts, etc. (from standard wooden components or from wooden components manufactured at the same establishment) or wooden coffins, caskets or joinery n.e.c. This class also includes establishments mainly engaged in installing (except on-site fabrication) shop fronts made of wood, or joinery (including custom made prefabricated built-in furniture).

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing wooden or wooden framed doors (except small cupboard type doors) are included in Class 2534; (b) in manufacturing wooden furniture (except custom made built-in furniture) are included in Class 2541; and (c) in on-site fabrication of built-in furniture or other joinery, or in erecting prefabricated wooden buildings are included in the appropriate classes in Division E Construction.

Group	Class	Title and Description

253 WOOD AND WOOD PRODUCTS - contd

2535 WOODEN STRUCTURAL FITTINGS AND JOINERY N.E.C. - contd

Primary Activities

Built-in furniture, custom made, mfg or installation (except on-site fabrication of built-in furniture)
Coffins or caskets, wooden, mfg
Door-window units, wooden, mfg
Fittings, structural wooden, mfg
Gates, wooden, mfg
Joinery mfg or installation (except on-site fabrication) n.e.c.
Mantlepieces, wooden, mfg
Office partitions, wooden, mfg or installation (except on-site fabrication)
Overmantles, wooden, mfg
Partitions, prefabricated wooden, mfg or installation (except on-site fabrication)
Prefabricated buildings, wooden or timber framed, mfg
Prefabricated wooden panels mfg
Prefabricated wooden structural fittings mfg
Roof trusses, wooden, mfg
Sashes, wooden, mfg
Shop fronts, prefabricated, mfg or installation (wooden; except on-site fabrication)
Window frames, wooden, mfg
Window sashes, wooden, mfg
Wooden doors mfg (small cupboard type)

2536 WOODEN CONTAINERS

This class consists of establishments mainly engaged in manufacturing wooden containers, pallets or staves.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing shooks for containers are included in Class 2531; and (b) in manufacturing wooden coffins or caskets are included in Class 2535.

Primary Activities

Barrels, wooden, mfg
Boxes, wooden, mfg
Cases, wooden, mfg
Casks, wooden, mfg
Crates, wooden, mfg
Fruit cases, wooden, mfg
Kegs, wooden, mfg
Packing cases, wooden, mfg
Pallets, wooden, mfg
Staves mfg
Tea chests, wooden, mfg
Vats, wooden, mfg

Australian Standard Industrial Classification : Detailed Classification

DIVISION C : MANUFACTURING - contd

SUBDIVISION 25 : WOOD, WOOD PRODUCTS AND FURNITURE - contd

Group	Class	Title and Description
253		WOOD AND WOOD PRODUCTS - contd
	2537	HARDWOOD WOODCHIPS

This class consists of establishments mainly engaged in manufacturing hardwood woodchips.

EXCLUSIONS/REFERENCES: Establishments mainly engaged in manufacturing softwood (coniferous) woodchips are included in Class 2531.

Primary Activities

Woodchips, hardwood, mfg

2538 WOOD PRODUCTS N.E.C.

This class consists of establishments mainly engaged in manufacturing wood, cork, bamboo or cane products, n.e.c. (including carved or turned wood products, ornamental wood work, wooden picture or mirror frames, parquetry flooring or basketware). This class also includes establishments mainly engaged in picture framing.

Primary Activities

Axe handles mfg
Bamboo products mfg n.e.c.
Basketware mfg (except metal)
Bobbins, wooden, mfg
Breadboards, wooden, mfg
Cane products mfg n.e.c.
Carved goods, wooden, mfg
Clothes pegs, wooden, mfg
Clothes props, wooden, mfg
Coat hangers, wooden, mfg
Cork or cork goods mfg
Corkboard mfg
Discs, wooden, mfg
Dowelling, wooden, mfg
Floor tiles, cork, mfg
Footwear components, wooden, mfg
Frames, wooden picture or mirror, mfg
Handles, wooden, mfg
Knobs, wooden, mfg
Ladders, wooden, mfg
Oars, wooden, mfg
Ornamental woodwork mfg
Parquetry flooring mfg
Patterns, wooden, mfg
Picture framing
Pipes, wooden, mfg
Plugs, wooden, mfg
Pulleys, wooden, mfg
Reels, wooden, mfg
Rollers, wooden, mfg
Rolling pins, wooden, mfg
Rulers, wooden, mfg
Sawdust mfg
Scaffolding, wooden, mfg
Shingles, timber, mfg
Skewers, wooden, mfg
Smoking pipes mfg
Spools, wooden, mfg

Group	Class	Title and Description

253 WOOD AND WOOD PRODUCTS - contd

2538 WOOD PRODUCTS N.E.C. - contd

Primary Activities - contd

Spoons, wooden, mfg
Spring rollers, wooden, mfg (for blinds)
Strawboard building boards mfg
Switchboard bases, wooden, mfg
Tableware, wooden, mfg
Textile combs, wooden, mfg
Tools, wooden, mfg
Toys or games, wooden, mfg
Trays, wooden, mfg
Wheels, wooden, mfg
Wood flour mfg
Wood turning
Wood wool mfg

254 FURNITURE AND MATTRESSES

2541 FURNITURE (EXCEPT SHEET METAL)

This class consists of establishments mainly engaged in manufacturing furniture (except custom made built-in furniture or furniture predominantly of sheet metal) or in upholstering, re-upholstering or french polishing of furniture. This class also includes establishments mainly engaged in manufacturing or installing shop fittings n.e.c.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing custom made built-in furniture are included in Class 2535; and (b) in manufacturing furniture predominantly of sheet metal are included in Class 3152.

Primary Activities

Bamboo furniture mfg
Bassinettes mfg
Bedroom suites mfg
Bedsteads mfg
Blackboards mfg
Bookcases mfg (except sheet metal)
Built-in furniture mfg (except custom made)
Cabinets, radio, radiogram or television, mfg (wooden)
Camp furniture mfg (except sheet metal)
Cane furniture mfg
Chairs mfg (except dentists)
Church furniture mfg (except sheet metal)
Cots mfg
Cupboards mfg (except sheet metal) n.e.c.
Desks mfg (except sheet metal)

Australian Standard Industrial Classification : Detailed Classification

DIVISION C : MANUFACTURING - contd

SUBDIVISION 25 : WOOD, WOOD PRODUCTS AND FURNITURE - contd

Group	Class	Title and Description
254		FURNITURE AND MATTRESSES - contd
	2541	FURNITURE (EXCEPT SHEET METAL) - contd

Primary Activities - contd

Dining room furniture mfg
Display stands mfg (except sheet metal) n.e.c.
Divan bases mfg (except upholstered bed bases)
Easels, wooden, mfg
Filing cabinets mfg (except sheet metal)
French polishing of furniture
Furniture, fibreglass, mfg
Furniture kits mfg
Furniture, plastic, mfg
Furniture polishing
Furniture, pre-cut, mfg (except sheet metal)
Furniture re-upholstering
Furniture, tubular metal, mfg
Furniture, wooden, mfg n.e.c.
Furniture, wrought iron, mfg
Garden furniture mfg (except sheet metal)
Hospital furniture mfg (except sheet metal)
Ice chests mfg (except metal)
Kitchen furniture mfg (except sheet metal)
Laboratory furniture mfg (except sheet metal)
Library furniture mfg (except sheet metal)
Lockers mfg (except sheet metal)
Lounge suites mfg
Office furniture mfg (except sheet metal) n.e.c.
Prefabricated furniture mfg (except sheet metal) n.e.c.
Racks, wooden, mfg
Restaurant furniture mfg (except sheet metal) n.e.c.
Shelves mfg (except sheet metal) n.e.c.
Shop fittings mfg or installation n.e.c.
Shop furniture mfg (except sheet metal) n.e.c.
Showcases mfg (except sheet metal) n.e.c.
Tables mfg (except sheet metal)
Theatre furniture mfg (except sheet metal)
Upholstered furniture mfg

2542 MATTRESSES (EXCEPT RUBBER)

This class consists of establishments mainly engaged in manufacturing mattresses, pillows or cushions (except of rubber).

Australian Standard Industrial Classification : Detailed Classification

DIVISION C : MANUFACTURING - contd

SUBDIVISION 25 : WOOD, WOOD PRODUCTS AND FURNITURE - contd

Group	Class	Title and Description
254		FURNITURE AND MATTRESSES - contd
	2542	MATTRESSES (EXCEPT RUBBER) - contd

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing wire mattress supports (not upholstered), of woven wire, link mesh or wire spring are included in Class 3168; and (b) in manufacturing rubber mattresses, pillows or cushions are included in Class 3462.

Primary Activities

Bed bases, upholstered, mfg (except rubber)
Box spring mattresses mfg
Cushions mfg (except rubber)
Innerspring mattresses mfg
Mattresses, plastic foam or sponge, mfg
Mattresses, upholstered, mfg (except rubber)
Pillows or cushions mfg (except rubber)
Sleeping bags mfg

Australian Standard Industrial Classification : Detailed Classification

DIVISION C : MANUFACTURING - contd

SUBDIVISION 26 : PAPER, PAPER PRODUCTS, PRINTING AND PUBLISHING

Group	Class	Title and Description
263		PAPER AND PAPER PRODUCTS
	2631	PULP, PAPER AND PAPERBOARD

This class consists of establishments mainly engaged in manufacturing wood pulp, paper or paperboard.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing (except commission printing) paper stationery are included in Class 2643; (b) in printing paper stationery on a commission basis are included in Class 2644; (c) in manufacturing bitumen or tar treated papers, felts or foils (including laminated or impregnated) are included in Class 2780; (d) in manufacturing chemically treated photocopying paper or sensitised photographic paper are included in Class 3341; and (e) in manufacturing plastic coated paper or paperboard, non-bituminous laminations of paper or paperboard with other materials, non-bituminised building paper or paperboard, or abrasive coated papers are included in Class 3471.

Primary Activities

Absorbent paper mfg
Art paper mfg
Bank paper mfg
Blotting paper mfg
Bond paper mfg
Brown paper mfg
Cardboard mfg n.e.c.
Container board mfg n.e.c.
Crepe paper mfg
Drawing cartridge paper mfg
Duplicating paper mfg (except chemically treated photocopying paper)
Filter paper mfg
Glassine paper mfg
Glazed paper mfg
Kraft paper mfg
Kraft paperboard mfg
Manilla paperboard mfg
Newsprint mfg
Paper felts mfg
Paper mfg n.e.c.
Paperboard mfg n.e.c.
Paper pulp mfg
Parchment mfg
Pasteboard mfg
Printing paper mfg
Solid fibreboard sheets mfg
Strawboard mfg (except building board)
Ticketboard mfg
Wood paper mfg
Wood pulp mfg
Wrapping paper, plain, mfg
Writing paper mfg (except paper stationery)

Group	Class	Title and Description

263 PAPER AND PAPER PRODUCTS - contd

2632 PAPER BAGS (INCLUDING TEXTILE BAGS)

This class consists of establishments mainly engaged in manufacturing paper bags (including multiwall bags of paper), meat wraps or textile bags (except canvas bags), or bags or sacks of woven plastic material.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing canvas bags (except water bags) are included in Class 3452; and (b) in manufacturing bags or packets of aluminium, plastic or cellulose sheeting, or of composite material of paper and plastic or metal foil are included in Class 3471.

Primary Activities

Bags, multiwall paper, mfg
Bags, paper and jute, mfg
Bags, paper, mfg
Bags, textile, mfg (except canvas bags)
Bags or sacks, woven plastic, mfg
Bulk material containers, nylon reinforced textile, mfg
Calico bags mfg
Hessian bags mfg
Meat wraps mfg

2633 SOLID FIBREBOARD CONTAINERS

This class consists of establishments mainly engaged in manufacturing solid fibreboard containers.

Primary Activities

Boxes, solid fibreboard, mfg
Cartons, solid fibreboard, mfg
Set-up boxes, solid fibreboard, mfg
Solid fibreboard containers mfg

2634 CORRUGATED FIBREBOARD CONTAINERS

This class consists of establishments mainly engaged in manufacturing corrugated fibreboard containers or corrugated fibreboard sheeting.

Group	Class	Title and Description

263 PAPER AND PAPER PRODUCTS - contd

2634 CORRUGATED FIBREBOARD CONTAINERS - contd

Primary Activities

Boxes, corrugated fibreboard, mfg
Cartons, corrugated fibreboard, mfg
Corrugated fibreboard containers mfg
Corrugated fibreboard sheets mfg

2635 PAPER PRODUCTS N.E.C.

This class consists of establishments mainly engaged in manufacturing paper patterns, drinking straws, paper novelties, toilet paper, cigarette papers, cellulose fibre insulation materials or other paper products n.e.c.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in manufacturing wood pulp, paper or paperboard are included in Class 2631; (b) in manufacturing paper bags, sacks or packets are included in Class 2632; (c) in manufacturing (except commission printing) paper stationery are included in Class 2643; (d) in printing paper stationery on a commission basis are included in Class 2644; (e) in manufacturing bitumen treated papers, felts or foils (including laminated or impregnated) are included in Class 2780; (f) in manufacturing chemically treated photocopying paper or sensitised photographic paper are included in Class 3341; and (g) in manufacturing plastic coated paper or paperboard, non-bituminous laminations of paper or paperboard with other materials, non-bituminised building paper or paperboard, abrasive coated papers, or pressure sensitive adhesive tapes (except surgical tapes) are included in Class 3471.

Primary Activities

Adhesive tapes, gummed, mfg (liquid activated)
Cigarette papers mfg
Cigarette tipping mfg
Cones, paper or paperboard, mfg
Confetti mfg
Cups, paper or paperboard, mfg
Decorations, paper, mfg
Doyleys, paper, mfg
Drinking straws mfg
Egg cartons, paper pulp, mfg
Fruit trays and cartons, paper pulp, mfg
Fruit wrapping pads, paper, mfg

Australian Standard Industrial Classification : Detailed Classification

DIVISION C : MANUFACTURING - contd

SUBDIVISION 26 : PAPER, PAPER PRODUCTS, PRINTING AND PUBLISHING - contd

Group	Class	Title and Description

263 PAPER AND PAPER PRODUCTS - contd

2635 PAPER PRODUCTS N.E.C. - contd

Primary Activities - contd

Greaseproof paper mfg
Gummed paper tape mfg
Insulation materials, cellulose fibre, mfg
Novelties, paper, mfg
Paper patterns mfg
Paper products mfg n.e.c.
Papier mache goods mfg
Patterns, cardboard, mfg
Plates, paper or paperboard, mfg
Serviettes, paper, mfg
Table napkins, paper, mfg
Tissue or sanitary papers mfg
Toilet paper rolls mfg
Towels, paper, mfg
Tubes, paper or paperboard, mfg
Wallpapers mfg
Waxed paper mfg
Yarns, paper, mfg

264 PRINTING AND ALLIED INDUSTRIES

2641 PUBLISHING

This class consists of establishments mainly engaged in publishing (but not printing) newspapers, magazines, books, sheet music, maps or other printed articles.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in both printing and publishing are included in Class 2642; and (b) in commercial or job printing (but not publishing) are included in Class 2644.

Primary Activities

Art prints publishing
Books publishing
Magazines publishing
Map mounting (except maps printed at the same establishment)
Maps publishing
Newspapers publishing
Periodicals publishing
Sheet music publishing

2642 PRINTING AND PUBLISHING

This class consists of establishments mainly engaged in both printing and publishing newspapers, magazines, books, sheet music, maps or other printed articles.

EXCLUSIONS/REFERENCES: Establishments mainly engaged: (a) in publishing (but not printing) are included in Class 2641; and (b) in commercial or job printing (but not publishing) are included in Class 2644.

APPENDIX B

INFORMATION ON MULTIPLIERS DERIVED FOR TASMANIAN FOREST-BASED INDUSTRIES

Selected pages reproduced from:
EDWARDS, G.C. *et al.*, 1981; *A 1977-78 Based Input-Output Model of the Tasmanian Economy;* Centre for Regional Economic Analysis, University of Tasmania, Hobart.

2.5.2 Forestry and Logging

The value of output in Forestry and Logging includes the value of forest products, the current expenditure of the Forestry Commission on management of forest resources, and the value of work of a capital nature carried out by the Forestry Commission on their own account.

Estimates for these items were extracted from the A.B.S. Annual Forestry Statistics Collection and from Forestry Commission reports. The value of work of a capital nature by the Commission (including re-afforestation, plantation establishment, silviculture and seed production) was allocated to the Gross Capital column.

The excess of current expenditure over royalty and other operating revenue was treated as an output to Public Authorities. Estimates of the output of forest products were principally based on A.B.S. collections. The value of input to the Forestry and Logging industry comprises the Forestry Commission's current expenditure on the management of forest resources and the costs associated with private logging operations. Usage data for the first item was extracted from the Annual Report and the 1977-78 accounts of the Forestry Commission and from A.B.S. collections.

Difficulties were encountered in establishing the logging costs of contractors and operators. Contractors' records, along with data published by the Tasmanian Logging Association, were examined to obtain a breakdown of inputs.

Estimates of the total number of jinkers and their ownership distribution (i.e. whether owned by owner-drivers, contractors or private logging companies) were made after examining information supplied by the Forestry Commission and Transport Commission. Where jinkers were owned by owner-drivers, their operations were treated as part of the Transport and Storage industry. The Forestry and Logging industry only encompassed the costs incurred where jinkers were owned by logging contractors.

Similar information, concerning numbers and operating hours, was collected for other logging equipment to provide a basis for estimating total operating costs.

Employment figures and expenditure on wages and salaries were derived from A.B.S. published statistics (after making adjustments for those employed in road and bridge construction and for jinker owner-drivers). The value of timber harvested on crown land was readily available but details of private land logging operations were inadequate. Timber royalties received by rural industry were used as a basis for estimating this item.

TABLE 4 SOURCE OF INDUSTRY INPUTS

		Percent of Total Usage		
		Tasmanian Industries	Imports	Wages
01	Sheep	29	3	38
02	Beef Cattle	26	5	56
03	Dairying	21	3	54
04	Pigs	49	5	28
05	Poultry	49	14	8
06	Fruit	33	12	47
07	Vegetables	28	10	28
08	Other Agriculture	34	14	26
09	Services to Agriculture	8	5	55
10	Forestry and Logging	35	11	37
11	Fishing and Hunting	23	5	41
12	Metallic Minerals	22	13	24
13	Construction Materials	25	7	28
14	Other Non-Metallic Minerals	17	8	31
15	Services to Mining	100	13	52
16	Meat Products	58	3	18
17	Milk Products	70	6	10
18	Fruit Products	48	5	17
19	Vegetable Products	63	8	23
20	Flourmill and Cereal Products	37	43	8
21	Bread, Cakes and Biscuits	46	9	32
22	Processed Seafoods	79	5	9
23	Other Food Products	16	48	16
24	Beverages and Malt	46	20	16
25	Textiles	21	37	27
26	Clothing and Footwear	31	26	35
27	Log Sawmilling	47	3	30
28	Resawn and Dressed Timber	56	2	32
29	Woodchips	68	3	11
30	Joinery and Fabricated Board	42	14	31
31	Furniture and Mattresses	45	13	33
32	Pulp, Paper and Paper Board	29	21	25
33	Other Paper Products	11	48	20
34	Publishing and Printing	26	10	47
35	Basic Chemicals	33	24	26
36	Other Chemicals	44	22	24
37	Clay Products	27	16	28
38	Cement and Concrete Products	39	15	27
39	Ready Mixed Concrete	74	4	9
40	Non-Metallic Min. Prods. nec	39	14	35
41	Basic Metal Products	33	43	18
42	Fabricated Metal Products	45	14	28
43	Ship and Boat Building	18	32	32
44	Other Manufacturing	21	23	32
45	Electricity	3	8	36
46	Other Utility Services	45	14	17
47	Residential Building	48	18	23
48	Road and Bridge Construction	47	6	42
49	HEC Construction	18	22	37
50	Other Building and Construction	42	16	29
51	Wholesale Trade	26	2	35
52	Retail Trade	20	9	37
53	Transport and Storage	29	29	48
54	Communications and Finance	13	15	41
55	Ownership of Dwellings	20	3	-
56	Public Administration	17	5	76
57	Community Services	15	2	76
58	Recreation and Entertainment	19	6	44

Another term for matrix A is the matrix of first round output effects. The initial stimulus of a dollar in the final demand for industry j's output always results in industry j producing an additional dollar of output; the total of column j, the initial impact, equals one. Each entry a_{ij} illustrates the first round effect on industry i, through sales to industry j, of the initial stimulus.

The classification of the multiplier effects used in this study follows that proposed by G. R. West and R. S. Jensen of the University of Queensland[1]. The major categories of effect/response are:

(i) The Initial Effect: This refers to the initial stimulus. For output multipliers it is the assumed dollar increase in sales to final demand.

(ii) The First Round Effect: This refers to the effect due to increased purchases by the industry providing the additional dollar of output.

(iii) The Industrial Support Effect: This refers to the second and subsequent round effects brought about by the first round impact.

(iv) The Consumption Induced Effect: This refers to the effect induced by increased income (wages and salaries) associated with the increased output.

N.B. (ii) and (iii) taken together are regarded as the production induced effect.

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1. G. R. West and R. C. Jensen - "Some reflections on Input Output Multipliers", The Annals of Regional Science, July 1980.

TABLE 8 TOTAL INCOME MULTIPLIERS

(IN RANKED ORDER OF TYPE II)

1.	Processed Seafoods	8.000
2.	Milk Products	7.209
3.	Ready Mixed Concrete	6.706
4.	Woodchips	6.578
5.	Poultry	4.934
6.	Meat Products	3.833
7.	Fruit Products	3.771
8.	Beverages and Malt	3.539
9.	Flourmill and Cereal Products	3.512
10.	Vegetable Products	3.273
11.	Other Utility Services	3.132
12.	Residential Building	3.017
13.	Resawn and Dressed Timber	2.871
14.	Other Chemicals	2.747
15.	Log Sawmilling	2.707
16.	Basic Metal Products	2.541
17.	Joinery and Fabricated Board	2.488
18.	Furniture and Mattresses	2.486
19.	Pigs	2.474
20.	Other Building and Construction	2.454
21.	Cement and Concrete Products	2.445
22.	Fabricated Metal Products	2.413
23.	Other Agriculture	2.402
24.	Pulp, Paper and Paperboard	2.284
25.	Road and Bridge Construction	2.277
26.	Basic Chemicals	2.248
27.	Non-Metallic Mineral Products n.e.c.	2.242
28.	Other Non-Metallic Minerals	2.205
29.	Vegetables	2.184
30.	Forestry and Logging	2.163
31.	Other Food Products	2.161
32.	Bread, Cakes and Biscuits	2.157
33.	Clay Products	2.119
34.	Metallic Minerals	2.114
35.	Construction Materials	2.057
36.	Sheep	2.033
37.	Clothing and Footwear	2.028
38.	Wholesale Trade	2.009
39.	Textiles	1.971
40.	Fruit	1.929
41.	Transport and Storage	1.919
42.	Other Manufacturing	1.919
43.	Ship and Boat Building	1.869
44.	H.E.C. Construction	1.858
45.	Retail Trade	1.858
46.	Other Paper Products	1.847
47.	Fishing and Hunting	1.828
48.	Publishing and Printing	1.826
49.	Beef Cattle	1.821
50.	Recreation and Entertainment	1.786
51.	Dairying	1.765
52.	Communications and Finance	1.712
53.	Public Administration	1.636
54.	Community Services	1.612
55.	Services to Agriculture	1.570
56.	Electricity	1.539

TABLE 9 TOTAL INCOME EFFECT PER $'000 CHANGE IN OUTPUT

(IN RANKED ORDER OF TOTAL EFFECT)

1.	Public Administration	1.238
2.	Community Services	1.227
3.	Beef Cattle	1.013
4.	Road and Bridge Construction	0.958
5.	Dairying	0.948
6.	Transport and Storage	0.919
7.	Resawn and Dressed Timber	0.907
8.	Fruit	0.905
9.	Publishing and Printing	0.862
10.	Services to Agriculture	0.860
11.	Furniture and Mattressess	0.830
12.	Forestry and Logging	0.804
13.	Log Sawmilling	0.803
14.	Non-metallic Mineral Products n.e.c.	0.788
15.	Recreation and Entertainment	0.779
16.	Sheep	0.775
17.	Joinery and Fabricated Board	0.775
18.	Fishing and Hunting	0.757
19.	Vegetable Products	0.747
20.	Milk Products	0.745
21.	Processed Seafoods	0.724
22.	Other Building and Construction	0.722
23.	Clothing and Footwear	0.718
24.	Meat Products	0.702
25.	Woodchips	0.701
26.	Communications and Finance	0.701
27.	Bread, Cakes and Biscuits	0.699
28.	Wholesale Trade	0.699
29.	Residential Building	0.694
30.	Other Non-metallic Minerals	0.692
31.	Pigs	0.690
32.	Retail Trade	0.686
33.	H.E.C. Construction	0.685
34.	Fabricated Metal Products	0.670
35.	Other Chemicals	0.664
36.	Cement and Concrete Products	0.649
37.	Fruit Products	0.637
38.	Other Agriculture	0.617
39.	Other Manufacturing	0.615
40.	Ready Mixed Concrete	0.614
41.	Vegetables	0.610
42.	Clay Products	0.604
43.	Ship and Boat Building	0.602
44.	Basic Chemicals	0.594
45.	Pulp, Paper and Paper Board	0.570
46.	Construction Materials	0.569
47.	Beverages and Malt	0.557
48.	Electricity	0.556
49.	Other Utility Services	0.538
50.	Textiles	0.532
51.	Metallic Minerals	0.515
52.	Basic Metal Products	0.457
53.	Poultry	0.408
54.	Other Paper Products	0.366
55.	Other Food Products	0.348
56.	Flourmill and Cereal Products	0.283

$$\text{Type 1A Income Multiplier} = \frac{\text{Initial + First Round Effect}}{\text{Initial Effect}}$$

$$\text{Type 1B Income Multiplier} = \frac{\text{Initial + Production Induced Effect}}{\text{Initial Effect}}$$

$$\text{Type II Income Multiplier} = \frac{\text{Initial + Production Induced + Consumption Induced Effect}}{\text{Initial Effect}}$$

In this format the output multipliers (whose initial effect denominator would equal one unit) can be compared with Type 1 and II income multipliers assuming an equivalent initial effect.

Table 9 shows that the industries with the highest total income effects excluding Services to Mining (see output multipliers), were Public Administration 1.238, Community Services 1.227 and Beef Cattle 1.013. The input coefficients of these industries showed a high wage component and thus the initial effect, in each case, is the dominating component of the multiplier as is usual for the service and rural sectors. Industries which have a high degree of interdependence with other industries have small initial effects but greater production induced effects.

3.7 Employment Multipliers

Analysts are often interested in the employment effects of stimulating the economy because of welfare considerations. Table 10 provides estimates of the average number of employees in 1977-78 for each

TABLE 12 TOTAL EMPLOYMENT MULTIPLIERS

(IN RANKED ORDER OF TYPE II)

1.	Woodchips	9.253
2.	Milk Products	8.242
3.	Processed Seafoods	7.379
4.	Ready Mixed Concrete	7.204
5.	Poultry	4.717
6.	Meat Products	4.615
7.	Other Utility Services	4.135
8.	Vegetable Products	4.071
9.	Fruit Products	3.607
10.	Beverages and Malt	3.468
11.	Construction Materials	3.466
12.	Flourmill and Cereal Products	3.460
13.	Residential Building	3.451
14.	Basic Metal Products	3.204
15.	Basic Chemicals	3.122
16.	Resawn and Dressed Timber	3.069
17.	Metallic Minerals	2.973
18.	Cement and Concrete Products	2.939
19.	Pulp, Paper and Paperboard	2.917
20.	Forestry and Logging	2.913
21.	Other Non-Metallic Minerals	2.816
22.	Log Sawmilling	2.752
23.	Joinery and Fabricated Board	2.656
24.	Other Chemicals	2.622
25.	Other Building and Construction	2.616
26.	Road and Bridge Construction	2.602
27.	Non-Metallic Mineral Products n.e.c.	2.555
28.	Pigs	2.539
29.	Fabricated Metal Products	2.474
30.	Furniture and Mattresses	2.427
31.	Other Paper Products	2.306
32.	H.E.C. Construction	2.271
33.	Bread, Cakes and Biscuits	2.238
34.	Other Agriculture	2.238
35.	Transport and Storage	2.186
36.	Vegetables	2.137
37.	Textiles	2.096
38.	Publishing and Printing	2.046
39.	Other Food Products	2.036
40.	Clay Products	1.986
41.	Public Administration	1.975
42.	Sheep	1.956
43.	Other Manufacturing	1.918
44.	Ship and Boat Building	1.900
45.	Electricity	1.865
46.	Wholesale Trade	1.859
47.	Clothing and Footwear	1.853
48.	Beef Cattle	1.810
49.	Community Services	1.781
50.	Fishing and Hunting	1.771
51.	Communications and Finance	1.741
52.	Dairying	1.698
53.	Fruit	1.694
54.	Retail Trade	1.672
55.	Recreation and Entertainment	1.657
56.	Services to Agriculture	1.558

TABLE 13 EMPLOYMENT EFFECTS PER $'000 CHANGE IN OUTPUT

(IN RANKED ORDER OF TOTAL EFFECT)

		Initial Impact	Prod'n Induced	Consmn Induced	Total
1.	Community Services	0.081	0.009	0.055	0.145
2.	Fruit	0.082	0.017	0.040	0.140
3.	Beef Cattle	0.076	0.016	0.045	0.137
4.	Dairying	0.079	0.013	0.042	0.134
5.	Public Administration	0.067	0.010	0.055	0.133
6.	Services to Agriculture	0.077	0.005	0.038	0.120
7.	Recreation & Entertainment	0.070	0.011	0.035	0.116
8.	Road & Bridge Construction	0.043	0.027	0.043	0.113
9.	Transport & Storage	0.050	0.019	0.041	0.110
10.	Resawn & Dressed Timber	0.035	0.033	0.040	0.109
11.	Furniture & Matresses	0.045	0.027	0.037	0.109
12.	Fishing & Hunting	0.061	0.013	0.034	0.108
13.	Sheep	0.055	0.018	0.034	0.108
14.	Clothing & Footwear	0.058	0.017	0.032	0.107
15.	Retail Trade	0.064	0.013	0.031	0.107
16.	Wholesale Trade	0.055	0.016	0.031	0.102
17.	Processed Seafoods	0.014	0.056	0.032	0.102
18.	Milk Products	0.012	0.056	0.033	0.101
19.	Publishing & Printing	0.049	0.013	0.038	0.100
20.	Log Sawmilling	0.036	0.027	0.036	0.099
21.	Joinery & Fabricated Board	0.036	0.025	0.034	0.095
22.	Communications & Finance	0.053	0.008	0.031	0.093
23.	Fruit Products	0.026	0.038	0.028	0.092
24.	Vegetable Products	0.022	0.036	0.033	0.091
25.	Pigs	0.036	0.025	0.031	0.091
26.	Other Chemicals	0.035	0.026	0.030	0.091
27.	Non-Metallic Min. Products nec	0.036	0.020	0.035	0.091
28.	Forestry & Logging	0.031	0.023	0.036	0.090
29.	Bread, Cakes & Biscuits	0.040	0.019	0.031	0.090
30.	Other Building & Construction	0.034	0.023	0.032	0.090
31.	Meat Products	0.019	0.039	0.031	0.089
32.	Other Agriculture	0.038	0.020	0.027	0.085
33.	Other Manufacturing	0.043	0.012	0.027	0.083
34.	Residential Building	0.024	0.027	0.031	0.082
35.	Vegetables	0.038	0.016	0.027	0.082
36.	Clay Products	0.041	0.014	0.027	0.082
37.	Fabricated Metal Products	0.033	0.019	0.030	0.082
38.	Ship & Boat Building	0.042	0.011	0.027	0.079
39.	Woodchips	0.008	0.038	0.031	0.078
40.	HEC Construction	0.033	0.011	0.030	0.074
41.	Beverages & Malt	0.021	0.027	0.025	0.073
42.	Cement & Concrete Products	0.023	0.016	0.029	0.068
43.	Ready Mixed Concrete	0.009	0.030	0.027	0.067
44.	Textiles	0.032	0.011	0.024	0.067
45.	Other Non-Metallic Minerals	0.024	0.012	0.031	0.066
46.	Pulp Paper & Paper Board	0.021	0.015	0.025	0.061
47.	Basic Chemicals	0.019	0.014	0.026	0.059
48.	Other Utility Services	0.014	0.021	0.024	0.059
49.	Electricity	0.031	0.002	0.025	0.057
50.	Construction Materials	0.016	0.014	0.025	0.055
51.	Poultry	0.012	0.025	0.018	0.055
52.	Metallic Minerals	0.017	0.011	0.023	0.051
53.	Other Food Products	0.024	0.009	0.015	0.049
54.	Basic Metal Products	0.015	0.012	0.020	0.048
55.	Other Paper Products	0.017	0.006	0.016	0.039
56.	Flourmill & Cereal Products	0.011	0.014	0.013	0.038
57.	Ownership of Dwellings	0.000	0.010	0.006	0.016

APPENDIX 1

NOTE ON THE USE OF EMPLOYMENT AND INCOME MULTIPLIERS

An output multiplier can be used to determine the effect on total output in the economy of a stimulation to output or sales of a particular industry. In economic analysis employment and income effects are also considered important and are probably more widely used because of their social and political implications.

On page 62 of this report, it was pointed out that employment and income effects can be translated into a form which is comparable with output multipliers in the sense that it provides the effect of a one unit stimulation in the relevant variable. For example, a Type II employment multiplier refers to the response, in terms of total employment generated in the economy, of a stimulation to output of a particular industry that generated one additional employee in that industry. That is, the Type II employment multiplier is referring to the response in terms of per unit of employment rather than in terms of per unit of output or sales as in the case of output multipliers.

Therefore, Type II employment and income multipliers should not be used as the sole criterion to rank industries in terms of their economic desirability. For example, consider the cases of the Woodchip Industry, with a Type II employment multiplier of 9.253, and Road and Bridge Construction, with a multiplier of 2.602. Table 10 indicates that a $1,000 dollar stimulation in the output of woodchips has a total employment effect of 0.078 whereas, a similar stimulation in the road construction industry has a total employment effect of 0.113. That is, a $1 million increase in sales of woodchips would generate an additional employment of 78 persons in the economy whereas $1 million spent on constructing roads would

generate an additional employment of 113 persons. Thus, although Woodchips has the higher Type II multiplier, the employment generating effects of Road and Bridge Construction are greater, all other things being equal.

It should also be remembered that the compilation of input-output tables and the subsequent generation of multipliers are subject to a number of restrictive assumptions, which were outlined in the main body of the report.

APPENDIX C

THE QUESTIONNAIRE SCHEDULE

The University of Tasmania

Postal Address: Box 252C, G.P.O. Hobart, Tasmania, Australia 7001

Telephone: 202101. Cables 'Tasuni' Telex: 58150 UNTAS

IN REPLY PLEASE QUOTE:

FILE NO.

IF TELEPHONING OR CALLING

ASK FOR A. McCUAIG or
P. HOYSTED
PH. 202645

23/11/1981

Dear

We are postgraduate students at the University of Tasmania carrying out a research project on the role of forestry in the development of rural areas in Tasmania. The Esperance municipality is one of two areas which have been selected for particular attention. (The other is Spring Bay on the East Coast).

We are looking at the economic and employment contributions of forest industries to this area and have received help and guidance on these matters from the local council, business people, A.P.M. and the Forestry Commission. In such a study, the attitudes, opinions and knowledge of local people is also very important. Therefore, to fully describe the importance of forest industries to this area, we plan to carry out a questionnaire survey of 150 residents.

To this end we have selected your name at random from the electoral roll and would be most grateful if you would agree to answer our questionnaire. It takes about 1/2 an hour and covers such topics as the area as a place to live, changes that may have taken place and what people think are the most important things about the forest industries in Esperance. It is completely anonymous and no names or addresses will be kept.

We will be visiting your area during the next 4 weeks and if you are not sure about any aspect of this study we will gladly explain in greater detail.Of course, you are under no obligation to take part in our survey.

We hope that our work will contribute to a better understanding of the role played by forestry in Tasmania and so your help would be most valuable.

Yours sincerely,

Phillip Hoysted and Ann McCuaig

HELLO .....

My name is .....I am a Master's student at the University of Tasmania, studying the role of forestry in 2 Tasmanian rural communities : Spring Bay and Esperance Municipalities. Hopefully you have received a letter from me (Yes .....oh good). For this work it is important to learn about the way of life in the areas and people's feelings about the importance of forestry to their area. To do this I am carrying out a survey of 100 residents within each municipality, asking each person some general questions about the district. Could you spare about half an hour to answer them ? I can assure you that your answers are entirely confidential and no record will be kept of names and addresses. If it is inconvenient for you at the moment I will be happy to call again at a more suitable time.

INTERVIEW NUMBER .....

LOCATION .....ESPERANCE / TRIABUNNA

.....RURAL TOWN
COASTAL TOWN
RURAL RURAL
COASTAL RURAL

DATE OF VISIT(S) .....
.....
.....

INTERVIEWER .....

To start with I'd like to get some idea of your feelings about this municipality as a place to live.

1. First of all, could you tell me what are the best things about living here?

2. Are there any bad things about living here?

3. Which of the following categories best describes the municipality as a place to live? (Show card)

- ☐ 1. Very satisfactory
- ☐ 2. Satisfactory
- ☐ 3. Neither satisfactory nor unsatisfactory
- ☐ 4. Unsatisfactory
- ☐ 5. Very unsatisfactory

4. Do you see yourself as living here for a long time in the future?

- ☐ 1. Yes ..... GO TO Q.6
- ☐ 2. No ..... GO TO Q.5

5. Could you please tell me what is likely to be your main reason for moving out?

6. The following are some general comments that have been made about living in this area. As I read them out, would you please give me your opinion about each one by choosing one of the 5 options from this card.

COMMENTS	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
1. I find the pace of living too slow and quiet around here.	-2	-1	0	1	2
2. Not enough money is spent on reserves and National Parks in Spring Bay/ Esperance.	2	1	0	-1	-2
3. All young people who want to stay and work here are able to find a job.	2	1	0	-1	-2
4. People who've been living here a long time have welcomed new-comers to the area.	2	1	0	-1	-2
5. I am satisfied with the variety of retail outlets in the municipality.	2	1	0	-1	-2
6. Lack of social activities is a problem in the municipality.	-2	-1	0	1	2
7. The scenery of this area isn't a very important part of living here.	-2	-1	0	1	2

6.

COMMENTS	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
8.Many women are dissatisfied because they can't find a job around here.	-2	-1	0	1	2
9.Newcomers to the municipality haven't mixed in very well with the local community.	-2	-1	0	1	2
10.The municipality suffers from a general lack of Government services and facilities.	-2	-1	0	1	2
11.There are plenty of activities to keep children occupied here in Spring Bay/ Esperance.	2	1	0	-1	-2
12.At present, I don't think there's any need to worry about damaging the natural environment of this area.	-2	-1	0	1	2
13.A good thing about this municipality is that there are plenty of jobs for all the men.	2	1	0	-1	-2
14.It's lonely living here.	-2	-1	o	1	2
15.Local sporting facilities are exellent.	2	1	o	-1	-2

Now I wonder if we could talk about changes which have occurred within the community since you've been living here.

7. Would you say that the way of life in your area has changed

☐	1. Not at all	..... GO TO Q.13
☐	2. A little	
☐	3. Some	..... GO TO Q.8
☐	4. A lot	

since you've been living here?

8. Overall, have the changes made the area

☐	1. More pleasant	..... GO TO Q.9
☐	2. The same	..... GO TO Q.13
☐	3. Less pleasant	..... GO TO Q.11

as a place in which to live?

9. What changes have made the district <u>more</u> pleasant?

..... GO TO Q.10

10. What would you say has brought about these changes?

..... GO TO Q.13

11. What changes have made the district <u>less</u> pleasant?

..... GO TO Q.12

12. What would you say has brought about these changes?

The next few questions are concerned with decisions that affect activities in the area.

13. Are people told enough by local council about decisions that affect the community?

☐	1. Yes	GO TO Q.15
☐	2. No	GO TO Q.14
☐	3. Dont know ..	GO TO Q.15

14. Could you mention any particular instances?

15. Are people told enough about decisions made by industries which affect the community?

☐	1. Yes	GO TO Q.17
☐	2. No	GO TO Q.16
☐	3. Dont know ..	GO TO Q.17

16. Could you mention any particular instances?

17. Finally, are people told enough by Government Departments about decisions they make that affect the area?

☐	1. Yes	GO TO Q.19
☐	2. No	GO TO Q.18
☐	3. Dont know ..	GO TO Q.19

18. Could you mention any particular instances?

19. Do you think ordinary people have enough say in the way the municipality is developing?

☐	1. Yes	GO TO Q.21
☐	2. No	GO TO Q.20
☐	3. Dont know ..	GO TO Q.21

20. Could you mention any particular instances?

21. Now turning to industry in Spring Bay/Esperance (show card of 5 industries), could you please tell me which 3 industries you think add most to the character and charm of the area? Please put them in order of importance from 1 - 3.

    1. .....
    2. .....
    3. .....

22. Which 3 of the same industries (show card of 5) are people in the municipality most dependent on for employment? Again, please put them in order of importance.

    1. .....
    2. .....
    3. .....

23. Of those industries, please tell me which 3 are most important to overall community prosperity. Again, please put them in order of importance.

    1. .....
    2. .....
    3. .....

24. Is there any industry which you consider should have major changes made to it ?

    ☐ 1. Yes ..... GO TO Q. 25

    ☐ 2. No

    ☐ 3. Dont know } .. GO TO Q. 27

25. What industry ?

26. What changes?

27. If we can now turn to the future development of industry in this area, what employment changes do you think will occur in the following industries? (Show card)

Industry	Major Expansion in employment	Minor Expansion in employment	Stay the Same	Decline in Employ.	Dont Know
1. Fishing					
2. Woodchipping/pulp					
3. Tourism					
4. Farming					
5. Sawmilling					

Now I would like to talk particularly about forest industries in this municipality.

28. Considering the woodchip/pulp industry in the area, would you say that overall you feel favourably or unfavourably towards the industry?

☐	1. Favourable	GO TO Q.29
☐	2. Unfavourable	GO TO Q.32
☐	3. Dont know	GO TO Q.35

29. Could you please tell me why? (You feel favourable)

30. Despite these good points, do you feel that there are any significant problems associated with it?

☐	1. Yes	GO TO Q. 31
☐	2. No	GO TO Q. 35
☐	3. Dont Know ...	GO TO Q. 35

31. What sort of problems?

.... GO TO Q. 35

32. Could you please tell me why? (You feel unfavourable)

33. Despite these unfavourable aspects, do you feel that it has any good points?

☐	1. Yes	GO TO Q. 34
☐	2. No	GO TO Q. 35
☐	3. Dont know .	GO TO Q. 35

34. What are the good points?

35. Have you done anything recently to promote or oppose the woodchip/pulp industry, such as writing a letter to a newspaper or politician, or attending a meeting?

☐ 1. Yes - promoted
☐ 2. Yes - opposed
☐ 3. No

36. Do you belong to any organization or group which supports or is critical of the industry?

☐ 1. Yes - supports
☐ 2. Yes - critical
☐ 3. No

37. Which organization(s) is that?

38. FOR ESPERANCE RESIDENTS ONLY.

Esperance has a long history of involvement in the timber industry. Do you think the changing emphasis from sawmilling to pulping has affected the community?

☐	1.	Yes ..... GO TO Q. 39
☐	2.	No ..... GO TO Q. 40
☐	3.	Dont know . GO TO Q. 40

39. How do you think this change has affected the community?

40. Many comments have been made about the woodchip/pulp industry. From those that I read out, would you once again give me your opinion about each one. Here is the card of possible options.

COMMENTS	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
1. One of the best things about the woodchip/pulp industry is all the new people its brought to the municipality.	2	1	0	-1	-2
2. Clearfelled areas should be kept out of sight.	-2	-1	0	1	2
3. People are quite right to make a fuss about the dangers caused by log trucks on the roads.	-2	-1	0	1	2
4. The forests in the municipality are being cut down too	-2	-1	0	1	2

40.

COMMENTS	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
quickly.					
5.Log hauling doesn't cause too much noise in towns.	2	1	0	-1	-2
6.Harvesting for woodchips/pulp improves the natural beauty of the forests.	2	1	0	-1	-2
7.Working conditions in the industry are bad for family life.	-2	-1	0	1	2
8.I believe that not enough is known about the long-term effects of woodchipping/pulping on the forests.	-2	-1	0	1	2
9.TPFH/APM is very concerned for the needs of local people.	2	1	0	-1	-2
10.It doesn't really matter how often forests are cut down, productive forests will usually grow back.	2	1	0	-1	-2
11. The municipality is far too dependent on TPFH/APM.	-2	-1	0	1	2
12.Clearfelling forests does no harm to animals and plants.	2	1	0	-1	-2

41. Finally, here are some statements which have been made concerning other aspects of the woodchip/pulp industry. Again, as I read them out, would you please tell me how much you agree or disagree with them.

COMMENTS	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
1.Woodchipping/pulping will be a major industry in the area for at least the next 20 yrs.	2	1	0	-1	-2
2.Far too much wood is wasted in harvesting for woodchips/pulp.	-2	-1	0	1	2
3.Woodchipping/pulping provides more productive forests for the future.	2	1	0	-1	-2
4.Woodchipping/pulping provides steady income for those people involved in the industry.	2	1	0	-1	-2
5.Woodchipping/pulping creates many jobs in other industries.	2	1	0	-1	-2

41. COMMENTS	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
6.The long-term future of the woodchip/pulp industry is unsure.	-2	-1	0	1	2
7.Not enough forest on private land is being replanted.	-2	-1	0	1	2
8.The conditions of the roads makes driving very dangerous here.	-2	-1	0	1	2
9.Many people would have to leave the municipality if the rate of woodchipping/ pulping was halved.	2	1	0	-1	-2
10.The Forestry Commission is well aware of the possible effects of the woodchip/ pulp industry on animals and plants.	2	1	0	-1	-2
11.Road conditions in Spring Bay/Esperance are shocking.	-2	-1	0	1	2

Finally, may I have a few details about yourself. These will be used to determine how different groups of people think and not about any particular individual. Once again, I would like to assure you that this information is completely confidential.

42.Are you renting,buying or do you own this residence ?

- [ ] 1. Renting
- [ ] 2. Buying
- [ ] 3. Own

43.Is it your

- [ ] 1. Permanent home .....GO TO Q. 46
- [ ] 2. Holiday home .....GO TO Q. 44
- [ ] 3. Other .....GO TO Q. 46

44.HOLIDAY HOME OWNERS:

Approximately how much time do you spend here each year ?

- [ ] 1. 0 - 2 weeks
- [ ] 2. 2 - 4 weeks
- [ ] 3. 4 - 8 weeks
- [ ] 4. more than 8 weeks .....GO TO Q. 45

45.Is your permanent residence in this municipality ?

- ☐ 1. Yes
- ☐ 2. No .....GO TO Q. 50

46.Have you lived in this municipality all your life ?

- ☐ 1. Yes .....GO TO Q. 50
- ☐ 2. No .....GO TO Q. 47

47.How long have you lived in this municipality ?

- ☐ 1. Less than 1 yr.
- ☐ 2. 1 - 2 yrs.
- ☐ 3. 3 - 5 yrs.
- ☐ 4. 6 - 10 yrs.
- ☐ 5. 11 - 19 yrs.
- ☐ 6. More than 20 years.

48.Where did you live previously ?

.....

49.What was your most important reason for coming to this area ?

50.Do many of your relatives live in this municipality ?

- ☐ 1. Yes
- ☐ 2. No

51.What is your occupation ?

.....

IF UNEMPLOYED/HOME DUTIES, GO TO Q. 59

IF HOLIDAY HOME OWNER, GO TO Q. 62

52.Is your occupation

- [ ] 1. Full-time
- [ ] 2. Part-time

53.In what industry are you employed ?

- [ ] 1. Service
- [ ] 2. Woodchip/pulp
- [ ] 3. Sawmilling
- [ ] 4. Fishing
- [ ] 5. Farming
- [ ] 6. Other

54.How would you describe the working conditions in your industry ? (Show card).

- [ ] 1. Very satisfactory
- [ ] 2. Satisfactory ..... GO TO Q. 56
- [ ] 3. Neither satisfactory nor unsatisfacory..GO TO Q. 57
- [ ] 4. Unsatisfactory
- [ ] 5. Very unsatisfactory ..... GO TO Q. 55

55.In what ways are the working conditions unsatisfactory ?

.....GO TO Q. 57.

56.What are the most satisfying aspects of your working conditions ?

57.How long have you been employed in this occupation ?

- [ ] 1. Less than 1 yr.
- [ ] 2. 1 - 2 yrs.
- [ ] 3. 3 - 5 yrs.
- [ ] 4. 6 - 10 yrs.
- [ ] 5. More than 10 yrs.

58.What was your previous occupation ?

.....

59.What are the occupations of the other adult members of this household ?

.....

.....

.....

IF EMPLOYED, GO TO Q. 62

60.Have you looked for employment during the last year ?

- [ ] 1. Yes .....GO TO Q. 61
- [ ] 2. No .....GO TO Q. 61

61.How does a lack of permanent employment most affect you ?

62. Sex :

- [ ] 1. Male
- [ ] 2. Female

63. To which of the following age groups do you belong ?
(Show card).

- [ ] 1. 15 - 19 yrs.
- [ ] 2. 20 -24 yrs.
- [ ] 3. 25 - 34 yrs.
- [ ] 4. 35 - 44 yrs.
- [ ] 5. 45 - 54 yrs.
- [ ] 6. 55 - 65 yrs.
- [ ] 7. 65 +

64. What is your marital status ?

- [ ] 1. Single
- [ ] 2. Married
- [ ] 3. Divorced
- [ ] 4. Widowed
- [ ] 5. Other

65.What level of education have you reached ? (Show card).

- [ ] 1. Primary
- [ ] 2. Some secondary
- [ ] 3. Completed to School's Certificate.
- [ ] 4. Completed to Higher School's Certificate.
- [ ] 5. Further education/training - no degree.
- [ ] 6. Degree.
- [ ] 7. Don't know/NR.

66. In which of the following broad income groups does the total income of this household belong (before tax and other deductions) ?

	Weekly	Annually	(Show card)
[ ]	A Less than $36		
[ ]	B $36 - $58	1500 - 2999	
[ ]	C $59 - $87	3000 - 4499	
[ ]	D $88 -$115	4500 - 5999	
[ ]	E$116- $144	6000 - 7499	
[ ]	F$145- $175	7500 - 8999	
[ ]	G$174- $202	9000 -10499	
[ ]	H$203-$231	10500 -11999	
[ ]	I$232-$260	12000 -13999	
[ ]	J$261-$385	14000 -19999	
[ ]	KOver $385	$20 000 or more	

THANK'S IT THANK YOU VERY MUCH

APPENDIX D

REPRESENTATIVE SELECTION OF RESPONSES TO OPEN-ENDED QUESTIONS DISCUSSED IN CHAPTER 5

TABLE 5.2

Perceptions of life in Esperance and Spring Bay

A. Best Aspects

Country life - *country life, peace and quiet, slow pace of living, away from the city, plenty of room.*

Environment - *good air, climate, pleasant surroundings.*

Community - *friendly people, know everybody, people helpful and honest, born and bred here.*

Recreation - *close to water and beaches, good fishing, lots of outdoor recreation.*

Employment - *plenty of work, close to work, always worked here, good money.*

B. Worst Aspects

No bad things

Roads - any response relating to roads

Services and facilities - *education facilities poor, cost of things, bad water supply, difficult for maintenance and repairs.*

Social and cultural - *lack of entertainment, nothing to do, long way to go to do anything different e.g. go to the drive-in, lack of activities for kids.*

Employment problems - *lack of work, not enough work for women, no opportunities, fluctuations in seasonal conditions on farms.*

Community nature - *gossipy, narrow-mindedness of locals, community not as united, feel snubs more here.*

TABLE 5.11

Perceptions of the effects of changes in Esperance and Spring Bay

B. Most pleasant change in area

More leisure activities - *better entertainment, new clubs, more sporting events.*

Services and facilities - *better schools, more roads sealed, improved sewerage, more retail activity.*

Social relations - *new people, more life, more friendly active people, improved social opportunities for women.*

Employment - *more jobs, better work conditions, more women going to work, less hard work.*

C. Most unpleasant change in area

Adverse social - *less peace and quiet, not as much time to do things now, different attitudes of youth, people don't mix as well as they used to.*

Decline in industry and employment opportunities - *sawmilling closing down, less work, farms not going as well.*

TABLE 5.17

Overall feeling toward the pulpwood industry and reasons given for this

B. First reason for feeling favourable

Employment - *husband works there, worked in industry all life, employment for me and others, good working conditions.*

Community dependence - *keeps the place alive, it would be a ghost town without it, place has been built around the industry, it's a necessity, the industry supports the community, helps farmers, brought money to the area, it has lifted the standard of living.*

Forest management - *the forests are regenerated, regeneration will provide better forests in the future, decreases the fire risk, efficient use of a natural resource, uses waste timber, gets rid of old and poor quality timber.*

C. First reason for feeling unfavourable

Forest management/environment - *damages flora and fauna, causes climatic changes, causes erosion, destroys the scenery, wastes wood, it's taking good wood not the rubbish, the wood could be better utilized.*

Social/economic - *log trucks are noisy and dangerous, conditions of the roads due to log trucks, wood is sold too cheaply, the mill is taking from the community and not giving enough back, contractors don't get a fair deal, not enough processing done locally.*

TABLE 5.18

Comments on the pulpwood industry by those who favoured it

B. What significant problems does it have?

Forest environment - *pollutes the river and air, changes the rainfall, causes erosion and siltation, does not use the timber to the fullest extent, wastes wood, inadequate regeneration, not enough regeneration on private land.*

Road damage/danger - *highways degenerating because of it, the roads were not built for log trucks, too many trucks on the roads, it is dangerous - a major logging route is through the Derwent Valley.*

Social/economic - *not enough processing done here, not enough financial benefits for those employed by the industry, insecurity, not as stable as should be, decreasing employment.*

Apart from the use of open and close-ended questions in the survey questionnaire, a number of attitude scales were included to measure people's opinions of both the pulpwood industry and their community. The scales consist of a number of items or statements designed to reflect or "belong" to a particular variable (referred to as a dimension) under examination. Scaling methods, widely adopted in social research, provide an alternative and theoretically improved technique of gauging people's attitude to an issue than the more traditional and straightforward open and close-ended questioning technique. The latter often only provide snap reactions to snap questions: the researcher is unable to gain a qualitative measure of underlying attitudes but rather a quantitative picture of how many people said what. By using scaling methods, measurement of the extremity and strength of people's attitudes can be made; "instead of being satisfied with differences in kind, one attempts to measure differences in degree" (Moser 1958). Thus, the researcher is able to encapsulate complex questions such as degrees of prejudice or individual political perspectives. The measurement of people's attitudes to their community and the role of the pulpwood industry within that community fits well within this type of category.

The particular scaling method used in this study was originally developed by Likert (1932). Unlike some other scaling methods, the Likert scale has a major advantage in that the representativeness of scale items to the dimension under examination (attitude to be measured) is judged by people fairly typical of those ultimately to be studied. This narrows the possibility of the survey sample having a different interpretation of scale items to that of the interviewer. As with other numerical scales, use of the Likert scaling method enables respondents or cases to be ranked, for example from low to high according to their particular score along the scale.

APPENDIX E

THEORY AND METHOD OF CONSTRUCTION OF LIKERT ATTITUDE SCALES USED IN THE QUESTIONNAIRE SURVEY

In constructing a Likert scale a number of items or statements are given to a respondent who is asked to indicate whether he/she "strongly agrees", "agrees", "neither agrees nor disagrees", "disagrees" and "strongly disagrees" with each one. This format provides a measurement of the degree of agreement, enabling the respondent to be ranked. The statements given need only be moderate in that strength of agreement will be reflected in the response, and should be a positive or negative reflection of the dimension under examination. Numerical values are attached to each response, for this study values ranged from (-2) to (+2) (largely due to the conceptual advantage of using zero as a neutral position). After summing all items belonging to a dimension each respondent is then assigned an overall score which is then taken as a measure of his/her attitude to that particular dimension.

A major difficulty with the Likert scaling method is the problem of deciding just how accurately a single item "belongs" to a particular dimension. Furthermore, the research does not want to include items that fail to discriminate between people with differing views. These problems are largely overcome by pre-testing of attitude items and subsequent *item analysis*. The three (final) scales contained in the questionnaire were selected from a series of scale items pre-tested in the coastal town of Swansea, just outside the Spring Bay municipality. Swansea was chosen to avoid the possibility of the sample population being exposed to parts of the questionnaire prior to conducting the survey. It also fulfilled the requirement of the Likert scaling method that the scale items be judged by people fairly typical of those eventually surveyed. Like Triabunna, Swansea is a small coastal town on the East Coast experiencing a large increase in log truck traffic since TPFH began operations.

A total of 30 statements concerning the local community and 34 related to woodchipping were given to 20 interviewees. Each statement was designed to reflect a negative or positive aspect of major concerns

people might feel about their community and the pulpwood industry: for example, community unity, the level of social activity and, for the pulpwood industry, its effects on the environment. In order to select the best items for inclusion in the final scale, that is, those that most accurately reflect the attitude under examination, an initial check was made to ensure responses were consistent for related items; those that failed this check were discarded. At the end of the day scores were summed for each individual item. Items chosen for the questionnaire tended to show a normal distribution of responses from strong support to disagreement. This method was adopted to accommodate the major aim of the survey: to determine the attitudes and perceptions of various *groups* within each survey sample. It was assumed that items with an almost unanimous response were unlikely to differentiate between groups with varying attitudes to the particular dimension. Consequently these items were also discarded.

Questions 6, 40 and 41 of the questionnaire each represent a Likert scale used in the survey. Question 6 is concerned to measure people's attitudes to the community as a place to live. Five dimensions were selected which were considered to be important components of attitudes towards community life. They are environmental concerns, sense of community unity, livelihood, level of social activity, and finally the adequacy of services and facilities provided for the public. Two to four items relate to each one of these five dimensions. Question 40 was designed to measure people's attitudes towards the pulpwood industry. The dimensions chosen include attitudes toward effects on the human and physical environment, and towards the vulnerability of the community (particularly to market fluctuations in the industry). Three to five items were selected to represent each dimension. Due to its more empirical nature, the final scale, question 41, is more a composite measure of people's *perceptions* of the pulpwood industry rather than their

attitudes. This is reflected in the dimensions which covered the industry's effect on employment and the adequacy of forest management.

All items used to construct the attitude scales are presented below.

ATTITUDES TOWARD THE MUNICIPALITY AND COMMUNITY

(a) Environmental dimension

Not enough money is spent on reserves and National Parks in Esperance/Spring Bay.

The scenery of this area isn't a very important part of living here.

At present, I don't think there's any need to worry about damaging the natural environment of this area.

(b) Social activity dimension

Lack of social activities is a problem in the municipality.

There are plenty of activities to keep children occupied here in Esperance/Spring Bay.

(c) Community unity dimension

People who've been living here a long time have welcomed new-comers to the area.

New-comers to the municipality haven't mixed in very well with the local community.

(d) Livelihood dimension

All young people who want to stay and work here are able to find a job.

Many women are dissatisfied because they can't find a job around here.

A good thing about this municipality is that there are plenty of jobs for all the men.

(e) Services/facilities dimension

I am satisfied with the variety of retail outlets in the municipality.

The municipality suffers from a general lack of Government services and facilities.

Local sporting facilities are excellent.

ATTITUDES TOWARD THE LOCAL PULPWOOD INDUSTRY

(a) Human environment dimension

One of the best things about the woodchip/pulp industry is all the new people it's brought to the municipality.

People are quite right to make a fuss about the dangers caused by log trucks on the roads.

Log hauling doesn't cause too much noise in towns.

Working conditions in the industry are bad for family life.

(b) Community vulnerability dimension

TPFH/APM are very concerned for the needs of local people.

The municipality is far too dependent on TPFH/APM.

Woodchipping pulping will be a major industry in the area for at least the next 20 years.

The long-term future of the woodchip/pulp industry is unsure.

(c) Physical environment dimension

Clearfelled areas should be kept out of sight.

The forests in the municipality are being cut down too quickly.

Harvesting for woodchips/pulp improves the natural beauty of the forests.

I believe that not enough is known about the long-term effects of woodchipping/pulping on the forests.

Clearfelling forests does no harm to animals and plants.

(d) Forest management dimension

Too much wood is wasted in harvesting for woodchips/pulp.

Woodchipping/pulping provides more productive forests for the future.

Not enough forest on private land is being replanted.

The Forestry Commission is well aware of the possible effects of the woodchip/pulp industry on animals and plants.

(e) Employment dimension

Woodchipping/pulping provides steady income for those people involved in the industry.

Woodchipping/pulping creates many jobs in other industries.

Many people would have to leave the municipality if the rate of woodchipping/pulping was halved.